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A CHILTON

PUBLICATION

The Iron Age

NATIONAL METALWORKING WEEKLY

June 5, 1952

TS PAGE 2

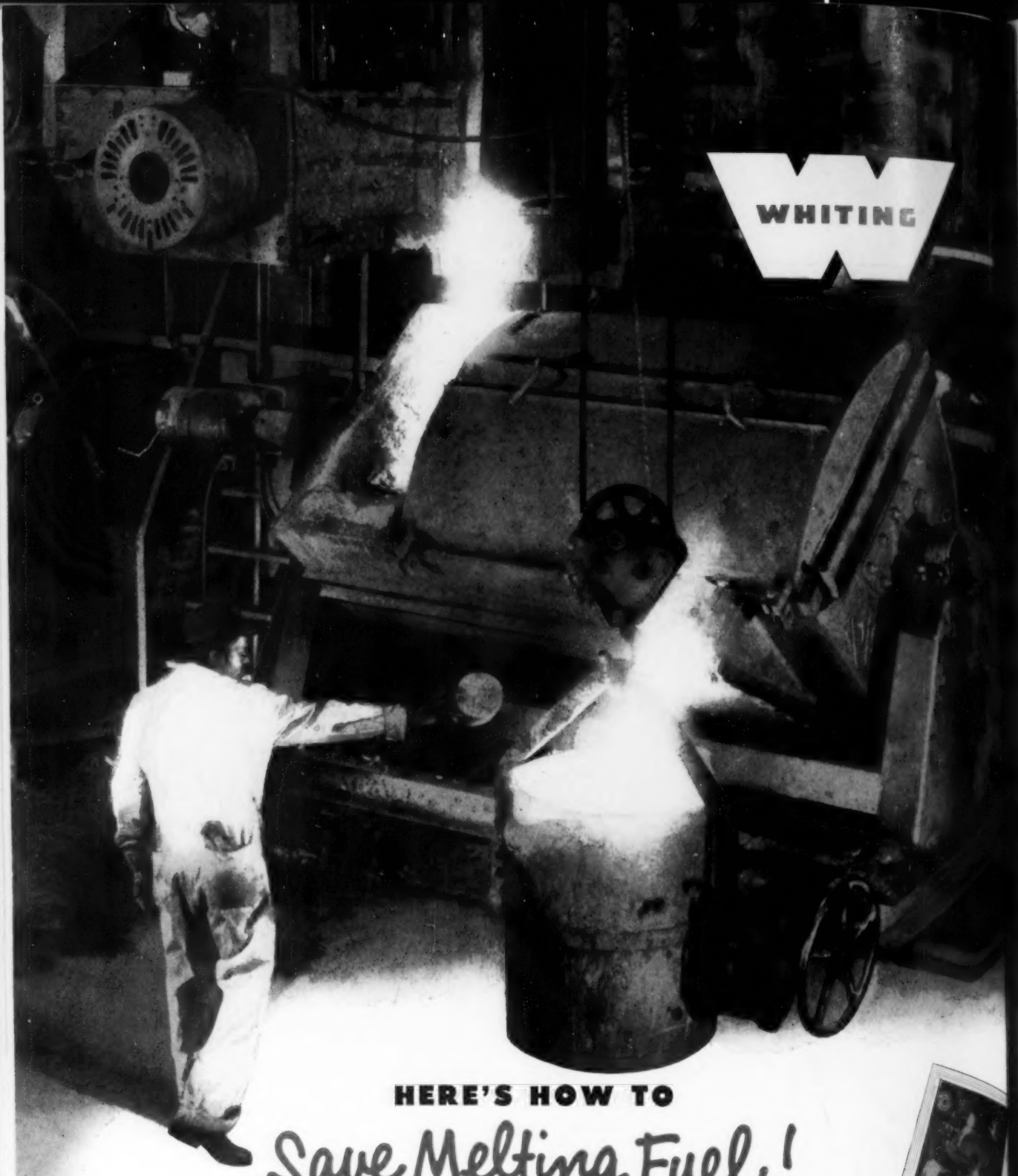


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IRON AGE

JUNE 5, 1952
VOL. 169, No. 23

THE IRON AGE

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DIGEST

of the week in metalworking

PAGE PURCHASING AGENT HIGHER IN POPULARITY

91 Salesmen are actually looking up the purchasing agent again. The PA is thrilled to see crowds in his waiting room. That forgotten phrase, "buyer's market," is mentioned more frequently. This was evident at the annual convention of purchasing agents held in Atlantic City in the past week.

PAGE METAL POWDER SALES OFF, STILL SOLID

93 Metal powder business has fallen from last year's high volume—but sales are still high. Although 1952 sales are about 60 to 80 pct of '51, they are still much above other periods. Imports of Swedish iron powder run 25 pct below '51. That puts them at the 1950 level—or double those of 1949.

PAGE STEEL DECISION COUNTERED BY STRIKE

94 The Supreme Court, voting 6-3, evicted the Administration from the steel industry. The decision ruled Truman's seizure unconstitutional—with no bones about it. A strike was called immediately by the union. It was seen orderly. Steel users had stocks of 30 to 45 days to back them up.

PAGE ADEQUATE SUPPLIES OF METALS IN SIGHT?

96 The time may be coming when nearly all metals and minerals will be in adequate supply without any more government stimulation, said Jess Larson, boss of defense materials procurement. He forecast that substantial amounts may be available for civilian work. He outlined the state of metals.

PAGE APPLIANCE MAKERS NOT LEAPING FOR JOY

97 Relaxation of credit curbs has not inspired jubilation in appliance makers. Rather the sales outlook stays sickly. Sales did rise after the death of Reg. W but manufacturers show no early inclination to strike with higher inventory. The iron may not be hot. Instead inventory may be held back.

PAGE STORE OIL IN GROUND INSTEAD OF TANKS?

115 The oil industry has been studying feasibility of storing crude and refined petroleum products underground. This may lead to need for less steel for tanks. Labor costs may also slide. Underground sites may satisfy part of the industry's growing storage needs. An all-around saving is seen.

PAGE GOLD PRICES HAVE LOST THEIR GLITTER

121 Canadian gold miners and prospectors are showing a fading interest in the glamour metal. This can be credited entirely to an inadequate price. Gold producers are hanging on, aided by government support, hoping for a rise in the official price. Meanwhile mining costs continue to increase.

PAGE ARE MACHINE TOOLS HEADED FOR SLUMP?

122 Some machine tool men are pointing to a downhill new order index and increasing shipments to substantiate fears of a slump coming up. Last month the new order index dropped below 300 for the first time since November. Shipments rose—and the backlog now stands at 15 months.

PAGE J & L USES RAMMED OPENHEARTH BOTTOMS

133 Rammed bottoms used on 250-ton openhearth at Jones & Laughlin Steel Corp. save 3 to 5 days in construction time over former methods. Furnace refractory life is increased by about 10 pct. Bottom installation is simplified. On 10 furnaces J & L picked up 70,000 tons of steel production.

PAGE SINTER PRODUCTION TIED TO PLANT DESIGN

145 Close control of operations and a carefully designed plant are needed for top production of blast furnace sinter. Open type ignition burners are low in original and operating cost. Slow air cooling gives strongest sinter. All wind boxes may be used for sinter if they are water cooled.

PAGE ANALYZE RUSSIAN TRACTOR ENGINEERING

150 Russian tractors captured in Korea are copies of a 10-year-old Caterpillar design. Analysis shows that Russian manufacturing processes are not second-rate. Up-to-date heat treatment was used. Internal cleaning of castings was poor. Close tolerances were held in machining only where necessary.

NEXT DIPPING IN ALUMINUM COATS STEEL PARTS

WEEK General Motors has developed a dipping process which puts a sound aluminum coating on fabricated steel parts of complex shape. The purpose is to give heat and corrosion resistance to the parts. It is in commercial use on steel parts which formerly had to be made of Inconel to stand up.

Where Production And Precision Count

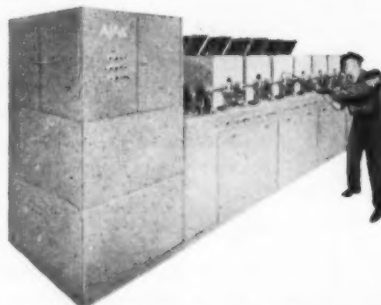
AUTOMOTIVE FORGINGS



CONNECTING RODS



PINION BLANKS



New Ajax-Northrup heater for automotive work has 8 heating stations, 30 interchangeable heating units. Heats billets from one to four inches, rounds or squares, to 2250°F at rate of 7500 to 8500 pounds per hour.



TRANSMISSION GEAR



AXLE SPINDLES



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AJAX-NORTHROP INDUCTION HEAT

Here's proof of Ajax-Northrup's ability to do the tough jobs... long run, high speed forging to exacting specifications.

The connecting rod billets are press-forged to a tolerance of 2 ounces. Smaller billets and elimination of scale give steel savings up to 20%. Production is increased 40%.

Ten tons of steel a day are saved by forging the axle spindles with improved methods based on scale-free induction heat. 16 men do the work of 46, and better fiber flow increases fatigue resistance of finished forgings by 17%.

The story's the same for gears, shafts, and countless other Ajax-heated forgings: Better forgings, at lower overall costs, with less steel. Call on our 35 years of induction heating experience—write us today.

SEND FOR NEW INDUCTION
HEATING AND MELTING BULLETIN

133

FOR HEATING AND MELTING

AJAX ELECTROTHERMIC CORPORATION

AJAX PARK
TRENTON 5, NEW JERSEY

Freedom's Victory

THOSE who had thought our freedoms and individual rights were on the way out received new hope this week. The clear-cut Supreme Court decision ruling against steel seizure was history in action. Those who feared—and with reason—dictatorship methods arising within our own government may now breathe a little easier.

True, there is a steel strike on; but that is a small price to pay for keeping our country as its founders intended it to be. The strike will be settled. But a ruling supporting the seizure would have put us on the road of no return to complete statism.

The verdict is a victory for steel people and the country. These steel men fought to the last ditch for what they believed to be their and our rights. In their hour of victory it is certain they will welcome the return of real, honest, down-to-earth collective bargaining.

From the first, the Administration blatantly took a one-sided stand with labor. Its power has been severely clipped. Philip Murray can prolong the strike, hoping he can force steel to agree to the Wage Stabilization Board recommendations; or he can come to the bargaining table with a new offer of his own.

The steel union now knows the tragedy of allowing itself to become entangled in the Administration's web of incompetence. It may be the final lesson that the union needed to dispense with the crutch of government help. It will now fight its own battles with steel on a collective bargaining basis alone.

Steel people said they were willing to bargain. They have already made at least two firm offers since the impasse was reached. They cannot and should not agree to any contract which spells inflation for the nation or weakening of the steel industry. It must remain a strong basic industry for our own protection. Only in that way can it afford to pay the wages it now pays and those it will pay under a new contract.

The road to a new contract will be hard and rough—but it can be traveled. We need a return to better relations between steel and labor. If it hurts to get this it will be worth it. The decision is good news to those who look beyond today—and beyond tomorrow.

Tom Campbell

Editor

BAKER TRUCKS require LESS MAINTENANCE

to you this means

- LESS TIME OUT OF SERVICE
- TOP OPERATING EFFICIENCY
- LOWER OVERALL COST

Baker Trucks are engineered and constructed to give maximum trouble-free service, and designed with many features for easier preventive maintenance and quicker, less costly repairs, when necessary. For example:

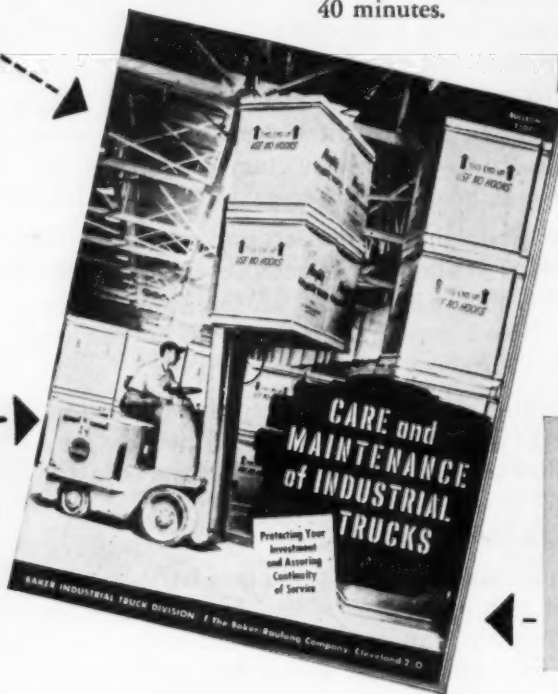


Electric dynamic braking saves wear on brake linings and protects drive axle and other moving truck parts by smoother, safer deceleration. Service brakes can be adjusted in 5 minutes, and relined in 30 minutes.

Baker exclusive Worm Drive Power Axle has fewer moving parts, is less subject to wear and does not lose efficiency with heavy loads or after long use. Mast assembly can be removed in 20 minutes and power axle pulled in 40 minutes.



Baker Rubber-mounted Trailing Axle is the simplest in use on industrial trucks. Can be removed from truck in less than 20 minutes by disconnecting steering tie rod and removing 8 bolts. Proper steering geometry prevents "scrubbing" of tires and means longer tire life.



Use of jumbo rubber blocks to absorb twisting axle action and road shocks eliminates need for spring connections. Blocks require no attention. Steering connections are above axle where they are protected from damage. Wheel bearings easily examined.



The above are 4 of the 60 illustrations from the new 16-page picture-story manual "Care and Maintenance of Industrial Trucks."

Write for your copy today.

Baker INDUSTRIAL TRUCKS

The Baker-Raulang Company
1227 West 80th Street • Cleveland 2, Ohio

☐ Please send me Bulletin 2100—"CARE and MAINTENANCE of INDUSTRIAL TRUCKS."

☐ I am also interested in _____ pound capacity fork trucks.

Name _____ Title _____

Company _____

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City _____ State _____

Dear Editor:

Letters from readers

Truman's Tantrum

Sir:

I am an avid reader of your magazine. I particularly like your editorials. Your editorial "Truman's Tantrum" in the Apr. 17 issue was a good one. It hit the nail on the head. . . .

E. P. STAHL

Newark, N. Y.

Exuberance Plus

Sir:

We have just seen the item on jet piercing in your May 8 issue. This is a short but interesting story on jet piercing.

We know that jet piercing is a fast method for piercing blast holes but it is now even faster than we thought. Someone in a moment of exuberance credited jet piercing with a speed of 60 fps. Actually, of course, with the new JPM-3 machine recently delivered to Reserve Mining Co., speeds up to 35 ft per hr have been obtained. This compares with 18 to 20 ft per hr of earlier jet piercing machines.

E. W. AXTHELM

Linde Air Products Co.
New York

Thirty-five ft per hr is correct.—Ed.

New Cutting Fluid

Sir:

We would appreciate receiving more information on the article "Develop New Cutting Fluid" which appeared on p. 158 of your May 15 issue.

J. J. AQUINO

Precise Mfg. Co.
Chicago

More information can be obtained from Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y., who developed this new fluid.—Ed.

Forming Molybdenum

Sir:

The article on slip casting molybdenum by G. L. Miller, appearing in your Apr. 17 issue, brings to mind the engineer's adage, "If it's new, it ain't true and if it's true, it ain't new."

The idea of slip casting molybdenum and tungsten powders seems to have occurred first to H. K. Richardson of the Westinghouse Corp., Bloomfield, N. J., in 1925 (see the Journal of the American Ceramic Society 14, p. 65, 1935). The same idea occurred to the present writer independently in 1949 and Dr. Miller was, in fact, able to see small unfired crucibles made by this method during his visit to this laboratory in March 1950.

Perhaps the biggest problem en-

countered in making crucibles this way is obtaining thin walled ware of sufficient strength to stand handling. This difficulty may, however, be overcome by the correct use of binders such as polyvinyl alcohol. Thin walled crucibles which require no machining may be cast by using a fairly dense plaster mold lined with filter paper or by dipping filter paper thimbles into a molybdenum slip. It is probable that fine molybdenum tubing could be made by the latter method, if the filter paper was replaced by an absorbent string.

P. D. S. ST. PIERRE

Dept. of Mines & Technical Surveys
Ottawa, Ont.

High Velocity Burner

Sir:

On p. 152 of your May 8 issue you describe a Thermal high velocity burner.

Would you please send me information on who manufactures this equipment.

K. SCHLUNDT

Deere & Co.
Moline, Ill.

Thermal Research & Engineering Corp., Mill Road, Conshohocken, Pa., is the manufacturer of this equipment.—Ed.

Kirksite

Sir:

In your Mar. 27 issue, p. 79, there is an article on kirksite. Can you supply us with a dozen tear sheets of this article?

A. NICHAMIN
Manager

Federated Metals Div.
American Smelting & Refining Co.
Detroit

Tool Steels

Sir:

The technical article entitled "New Tool Steels and Carbides" in your Mar. 6 issue is in great demand by several of our student engineers.

How may we obtain 12 reprints of this article for distribution in our company?

J. C. OLSON
Personnel Training Supervisor

Bullard Co.
Bridgeport, Conn.

Quality Control

Sir:

Please send us 10 reprints of the article "Quality Control Mandatory On New Air Force Orders" which appeared in your May 8 issue.

E. W. SCHOEN
Lincoln-Mercury Div.
Ford Motor Co.
Detroit

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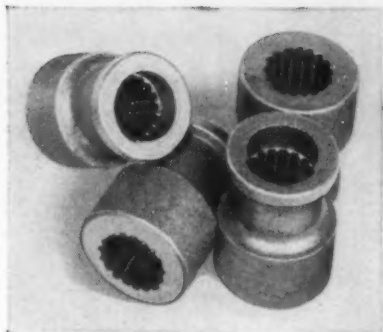
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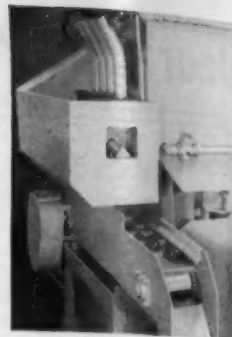
America's Greatest Buying Guide
18 East Huron St., Chicago 11, Ill.



13,600 Splines/hour on one machine

The part: Steel forgings in which 17 internal splines of 1½" O.D. are to be broached.

The machine: A Colonial 20-ton 48" stroke Pull-up with multiple loading chutes, positioning shuttle and automatic ejector conveyor.



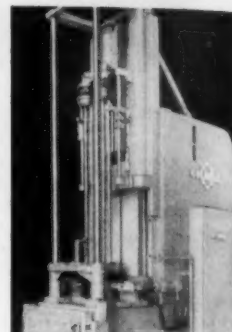
Colonials help you do **MORE JOBS** on **FEWER MACHINES**



12 Surfaces, 8 Bores on two machines

The part: Tank track forging requiring finishing of 6 flat surfaces and 4 bores in thin webs, broached two at a time.

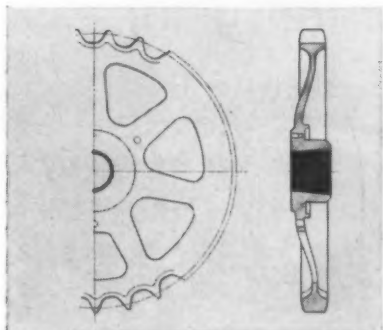
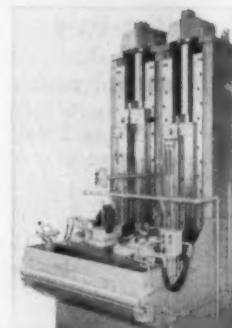
The machines: Colonial 25-ton Dual Ram for flat surfaces, Colonial Pull-down with automatic spreaders to support the part while broaching bores.



7 Surfaces, 4 Operations on two machines

The part: Tank track center guide to be completely machined as shown.

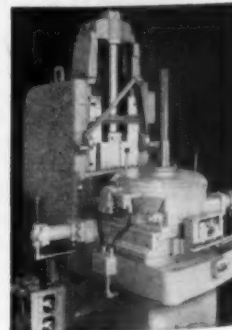
The machines: Two 25-ton Dual Ram machines perform all operations, produce one guide for each machine cycle.



Large Tapered Splines Broached in One Setup

The parts: Tractor wheel hubs, (several sizes).

The machine: Colonial 15-ton Pull-down equipped with special angular short-shuttle table, and automatic index.



For further information on the examples shown here, ask for Broaching News, Volume XIV, No. 1

Fatigue Cracks

by Charles T. Post

Initial Error

The perplexities involved in this age of substituting initials for names were pointed up last week by George S. Rose, Secretary of the American Iron & Steel Institute, in his speech before the metals section of the Special Libraries Assn.

Mr. Rose reported that when he turned the page on his daily calendar that morning he found the cryptic notation "3:30 p. m.—S. L. A." He scratched his head.

"How in the world," he wondered, "did the American Iron & Steel Institute get mixed up with the State Liquor Authority?"

Concentration

Life in the Library of Congress is no dull routine, Thomas S. Shaw, assistant in charge of public reference in the main reading room confided to another Special Libraries Assn. meeting.

The other day, he reported, a tired and hot little old lady hobbled up to the reference desk, asked for a glass of water. The librarian, with sympathy in her eyes, dug up a glass, filled it from the drinking fountain in the corridor, and brought it to the poor old lady.

Rather than draining it, the p. o. l. popped out her false teeth, put them in the glass. "Can't concentrate on my reading without taking out my teeth," she explained brokenly as she wandered off to her table.

Signs of Progress

Editor Tom Campbell found the American Airlines waiting room at LaGuardia Airport torn up in the process of renovation, but in partial use, as he boarded a plane for the West. The only inconvenience to the passengers resulted from a bold sign which warned: "Don't Walk on the Floor." Some of the less agile patrons slipped and slid as they climbed the walls to tiptoe across the ceiling.

Opportunity

If you know a young engineer with a hankering to see the latest engineering techniques as they are practiced by the country's most progressive plants—and then to write about them—tell the man to get in touch with Technical Editor D. I. Brown. He is looking for a

technical writer, a man with an engineering degree or a very good background in the metalworking industry. Whoever wins the job should plan to spend at least half his time on the road. In this business, you don't get many good articles swivelling in the home office.

Puzzlers

The force resulting from the smash-up in last week's puzzler was almost $2\frac{1}{2}$ tons, or 4788.56 lbs to be exact. If you are prone to bearing down on the accelerator perhaps, this will make you think a bit.

C. B. Smith, Portland Copper & Tank Works, disagreed with the answer we printed for the problem about the length of a beam that could be removed from a room whose only exit was a circular air shaft. Not satisfied with just his calculations he and some fellow workers constructed a scale model. This, he says, proves conclusively that our answer was wrong. The correct length should be 13.844089 ft. We yield.

The list of prospective gardeners is growing rapidly. The latest additions are W. L. Kann, Pittsburgh Crushed Steel Co.; R. W. Huff, Canton, Ohio; H. K. Morre, Eaton & Howard; G. H. Hull, Johnson Sheet Metal Works Corp.; L. D. Rice, Timken Roller Bearing Co.; A. L. MacDonald, The Holden Co., Ltd.; C. B. Smith, Portland, Copper & Tank Works; W. Fuv, Chamberlin Co.; E. Dieckmann, Steel Founders' Society of America; B. McLean, Arvin Industries Co.; J. Povalski, Edward Purvis & Son; L. E. Cooper, American Steel Suppliers, Inc.; J. B. Kenny, Clark Equipment Co.; F. L. Allen, National Malleable & Steel Castings Co.; F. J. Binckes, Binckes Engineering Co.; C. M. Gordan, Locke Dept. General Electric Co.; R. W. Shank, International Harvester Co., and C. W. Gruber, Battelle Memorial Institute.

J. J. Manderscheid, Jr., The Manderscheid Co., sends us his solution to the recent number problem.

E. H. Nicoletis, Arwood Precision Casting Corp., would like to know the area bounded by two concentric circles and a straight line which is a chord of the larger circle and tangent to the smaller one. The line is 6 in. long.

On any steel blackening problem

DEPEND on DU-LITE for a Superior Finish

Here's an example...



Courtesy The Poly Choke Co.

Du-Lite gave this part with its complicated knurls, slots, threads, etc. a fine rust-resistant durable black finish. It is typical of many other parts, small and large, which have been black oxidized by Du-Lite for many years. Moreover, Du-Lite meets most individual and government specifications including 57-0-2C for Type III Black Oxide finish.

Typical Du-Lite installation



Du-Lite installations are simple, compact, easy to operate. Du-Lite equipment can be tailored to fit production requirements on all types of jobs with a maximum of speed and economy. Du-Lite also makes a complete line of cleaners, strippers, wetting agents, passivating agents, rust preventatives, burnishing compounds etc. for any metal finishing application.

See your nearest Du-Lite Field Engineer or write for more information.

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METAL FINISHING SPECIALISTS

...another tribute to
LEVINSON workmanship



THIS important furnace installation, made for a leading eastern steel mill, was designed and engineered by Loftus Engineering Co., of Pittsburgh, world-famous builders of industrial furnaces.

In this particular job, Levinson co-operated by fabricating structural steel as specified . . . and delivering on time. This is just one of many examples of how Levinson helps expedite today's vital construction projects. And, as always, accurate fabrication is the keynote . . . saving time on the job and minimizing erection costs.



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GENERAL OFFICE
810 SMITHFIELD STREET
PITTSBURGH 22, PA.

December 19, 1951

Re: Our Contract 11-3308

The Levinson Steel Co.,
Pittsburgh, Pa.

Gentlemen:

On this particular order, we know it will interest you to know that our contractors report that in their years of experience erecting furnace binding, this was the first they had ever put together without once using a burning torch. The steel binding is now practically all installed.

Very truly yours,

LOFTUS ENGINEERING CORPORATION

F. A. Rahter

F. A. Rahter, Purchasing Agent

THE IRON AGE Newsfront

► Without fanfare, the U. S. is pushing delivery of its steel promise to Britain (ingots, tube rounds and other semi-finished). Contrary to expectations when the deal was made, some of the smaller firms have been glad to get a piece of this business at a fair price (some of the ingots have been sold at \$78 per net ton, others at \$73).

Steel exports now amount to about 5 pct of total shipments, compared to 3.6 pct for last year.

► A direct current electromagnetic pump with no moving parts has been developed to handle large quantities of liquid metals at fast flow rates. Between poles of an electromagnet, copper bars are soldered to tubing carrying the metal. Current passing through the liquid develops longitudinal thrust to "pump" the liquid. The project was developed at AEC's Argonne National Laboratory.

► Ford engineers have developed several devices to speed loading and ease handling of materials on fork trucks. Hydraulically operated attachments in conjunction with special loading fixtures made of steel tubing have cut handling time on some large sheet steel parts. To minimize direct pressure on small assemblies, scoops have been given pointed bases and sloping sides.

► Despite calming assurances from Washington that controls will be lifted as soon as possible, it's a fair bet that relaxation designed to appease industry will—if the bureaucrats have their way—be accompanied by standby control powers permitting their restoration at a moment's notice. This overhanging power will in some cases act about the same as would the actual controls.

► Severe bumps in jet planes traveling at high speeds are not inevitable, according to Lockheed engineers. They are now working on a secret super-cushioning apparatus. Part of the test setup will be a 4-ton electro-magnetic vibrator to cause jolts of a maximum intensity of 2-G.

► Tests at Cornell Aeronautical Laboratory indicate that in the design of structural components from type 316 stainless steel, 1600°F would be a conservative working temperature limit. A peak of 1800°F could be tolerated at stresses within 1000 psi where short life expectancy would be sufficient.

► Low foreign labor rates are pushing U. S. shipbuilders hard. Japan will probably move into fourth place (after Britain, Germany and Sweden) in tanker building. The Japs have 30 tankers totaling 400,000 gross tons now under construction, of which 13 (184,750 tons) are for foreign owners.

If the Allies approve, Germany may resume construction of midget submarines, carrying one or two operators, to protect North Sea and Baltic ports.

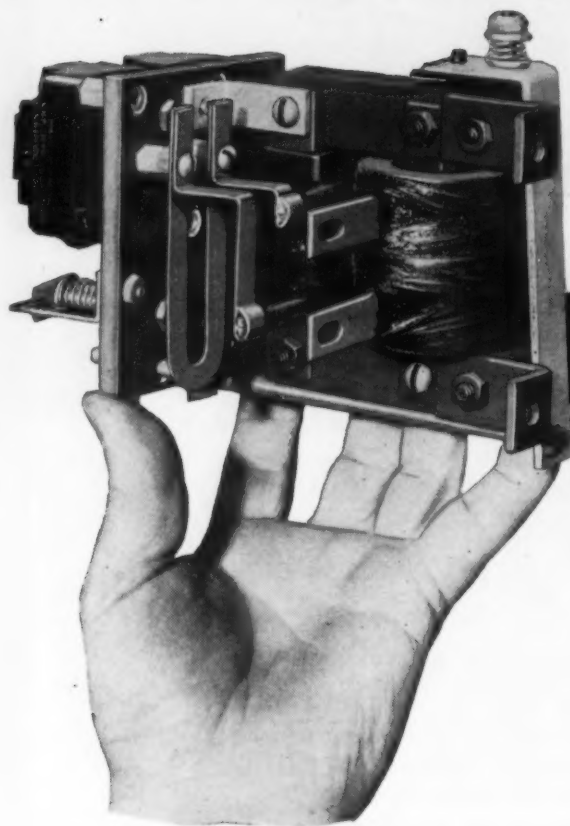
► Slots in a type composing machine are now being drilled and hobbled, replacing a former milling operation and reducing machining time from more than 2 hr to 30 min.

► Aluminum manufacturers are putting heavy emphasis on selling new ideas and techniques—giving warehousemen special sales helps for their customers. A New Jersey warehouse now has an exhibition trailer display which it drives around to conventions as well as to customers' plants.

NEW EC&M Thermal-Magnetic OVERLOAD RELAYS

COMPLETELY PROTECT
A-C MOTORS UNDER all CONDITIONS

DIRECT-ACTING—NO DASHPOTS



Above—relays are front-connected and may be removed as a unit from the mounting base. U-shaped bimetal acts directly on tripping lever.

Instantaneous Trip
(magnetically)

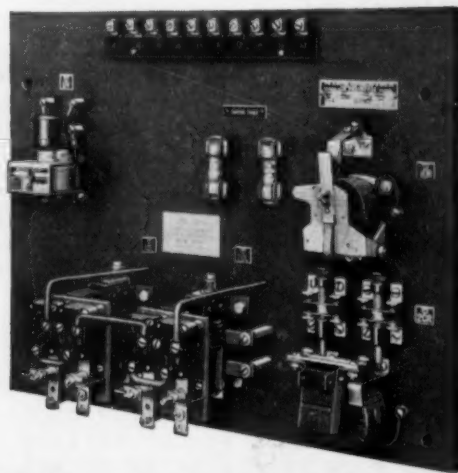
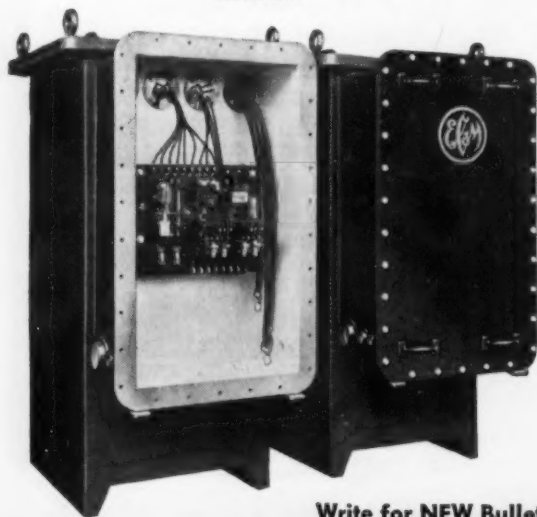
Timed Responsive Trip
(thermally)
on Single Phase, Failure to
Start, during Running, etc.—
all in this one relay

ADVANTAGES

- 1 Inverse time-delay operation on overloads.
- 2 Instantaneous operation on short circuits.
- 3 Short thermal reset time.
- 4 Saturable core aids thermal inverse time element operating characteristics.
- 5 Transformer couples motor current to thermal action, resulting in accurate transmission of motor operating current for quick, positive response.
- 6 V-split laminated core, mechanically and magnetically locked, permits changing primary coils easily.
- 7 Primary coils have wider current ranges than comparable heater-type relays, resulting in fewer coils for wide range of motor sizes.

These Thermal-Magnetic Relays eliminate useless tripping on harmless temporary overloads. They provide positive, timed response to the thermal energy of load currents, and protect the motor from overheating.

No. 20 H-50 Type ZHS Starter in Type VIII Enclosure.



Type ZTM Overload Relay Panel with Time-Delay Under-Voltage Protection Feature.

Write for NEW Bulletin 1180-38 describing these new relays.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO



BUYING: End of Sellers' Market in Sight

Purchasing agents popular again as salesmen seek them out . . . Optimism keynotes Atlantic City meeting . . . Majority feels price trend is down . . . Supplies easier—By J. B. Delaney.

Industry's "forgotten man"—the purchasing agent—is beginning to live again.

Salesmen actually are looking him up. A few P.A.'s report the delightful experience of jammed waiting rooms. Hard-to-get items, once an impressive list, are becoming fewer. Prices are down on many products, up on relatively few. The almost-forgotten term, "buyer's market," is mentioned with some frequency.

Even the prospect of a pattern-setting wage increase in steel isn't scaring industry's buyers. More than half—56 pct—feel the price trend is down, only 11 pct believe prices will increase. The remainder look for a leveling off. The majority cite increasing availability of materials, increasing capacities to produce, and growing competition to support their view.

Optimistic—These marketplace developments injected a note of

quiet optimism into proceedings at the 37th annual convention of the National Assn. of Purchasing Agents at Atlantic City last week. Nearly 3000 P.A.'s attended the 4-day meeting.

Buyers are strong for removal of controls. But they got little encouragement from Washington. A government spokesman told them controls will be with us for quite some time—and they might as well get used to the idea.

Prices Down—A recent survey by NAPA showed prices up on only four items—industrial diamonds, vegetable oils, glass bottles, and die castings. Prices are down on 37 important products, including secondary aluminum, brass ingots, cast iron scrap, lead, warehouse steel, small diameter steel pipe, scrap zinc, small tools, alcohol, coal, coke, small motors and controls, fuel oil, lumber, mercury, paper, propane, rubber, textiles, and tires.

Significant was the comment of many buyers that more prices would be off if suppliers had some assurance that the reduced prices would not be interpreted by Office of Price Stabilization as new ceilings.

Supply—Hard-to-get items, according to the survey, include "some aluminum products," aviation gas, cobalt, copper, diamond wheels, nickel, and large diameter pipe. Easier from a supply standpoint are bearings, steel castings, forgings, iron pipe, sulfur, warehouse steel, scrap steel, wire, and industrial mill supplies.

The so-called inventory recession of 1949, marked by drastic

price reductions, was recalled by one speaker, Robert C. Swanton, chairman of NAPA's Business Survey Committee, and director of purchases for Winchester Repeating Arms Co. Mr. Swanton pointed out there are some similarities in the current business picture to conditions preceding the 1949 business dip.

Inventories—The purchasing agents reported that industrial inventories are down—50 pct of those surveyed, compared with 23 pct a year ago. Buying policies are more conservative. A year ago 83 pct were holding their principal purchases to a range of "hand-to-mouth" to 90-day coverage, with the accent on 60 to 90 days. Today 97 pct are within the 90-day range, with emphasis on 30 to 60 days.

On the general business outlook the purchasing agents are cautious about predicting beyond the third quarter of 1952. Consensus seemed to be that industry is in for a slow summer, possibly a soft third quarter.

Summing up, NAPA sees nothing alarming over the apparent



H. W. Christensen . . . NAPA president.



Robert C. Swanton . . . The Shipman Award.

Aircraft Parts:

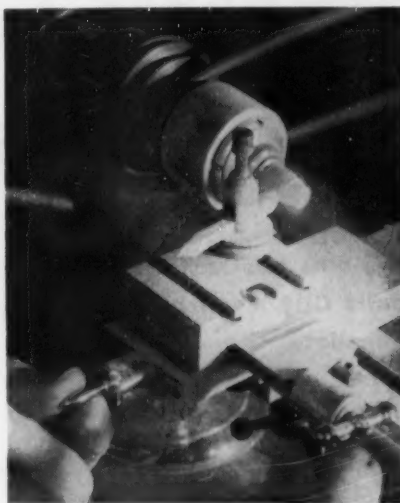
Jeweler's lathes used in delicate production work at AiResearch lab.

Levin Lathes, the type used by watch makers, have been adapted to the production of delicate aircraft parts, reports AiResearch Co., Los Angeles.

An example of one of the intricate jobs accomplished by these tiny lathes is lap-winding 4000 turns on a minute armature 1 in. long and 3/16 in. in diameter. The armature is the heart of a vibration pickup coil used in an instrument said to balance dollar-sized air turbine wheels within 0.000005 of an in.

AiResearch admits that perfect balance cannot be attained, but believes it comes as close as possible when its midget air turbine wheels are tuned-up to spin at 100,000 rpm. Any appreciable wobble at that speed could set up vibrations which would wreck the delicate air turbine refrigeration unit and endanger the life of the pilot.

To meet the mechanical perfection required in the production and design of more than 700 precision accessory products for late model jet and turboprop aircraft, AiResearch has invested in one of



PRECISE: Soapstone coil forms are turned on a jeweler's lathe at AiResearch Co., Los Angeles.

the best equipped laboratories in the country. Since most of the test equipment used in the lab is not on the market, the Levin Lathe is employed to produce the parts needed.

Work turned out on the jeweler's lathe is said to meet tolerances fifty times closer than those required in the finest watches. Uses for the lathe range from shaping soap-stone coil forms 5/16 to 1/8 in. in diameter to spinning silver tubing for thermo-couple shields.

Patents:

Armco sues U. S. Steel, claiming violation of Sendzimir patents.

Armco Steel Corp. filed a patent infringement suit against U. S. Steel Co. in the Federal District Court in Pittsburgh last week. The suit alleges violation of patents on the Sendzimir galvanizing process.

The complaint seeks an injunction against infringement of three patents, two issued in 1938 and the third in 1940. It also seeks an accounting of profits and damages resulting from the alleged infringement of the patents.

Operate Four Lines — W. W. Sebald, Armco president, said the patents are the inventions of Taduesz Sendzimir, and Armco has the exclusive right under the patents for zinc and aluminum coated material. They have been in use at Armco since 1936 for production of steel strip coated with zinc and aluminum. Armco presently operates four such continuous coating lines, two in Middletown, Ohio and two in Butler, Pa. In 1950 Armco licensed Inland Steel Co. to produce zinc coated steel under these patents.

Special Report

Continued

trend toward lower business activity, pointing out that compared with "normal" years overall business is at a very high rate and can continue to stay that way.

Present—Principal speakers included I. W. Wilson, president of Aluminum Co. of America; H. G. Batcheller, chairman, Allegheny Ludlum Steel Corp.; Whipple Jacobs, president of Phelps Dodge Copper Products Corp.; John L. Collyer, president of B. F. Goodrich Co.; Chester F. Ogden, retiring president of NAPA; Dr. Edwin G. Nourse, formerly with the Council of Economic Advisers.

Mr. Batcheller said without qualification that the so-called steel shortage definitely is over,

that black and gray markets have about disappeared. "There are even some indications of idle capacity," he said. Steel capacity, he pointed out, has more than kept pace with population growth—increasing five-fold compared with a doubling of population since 1900.

Regrets—On behalf of the steel industry, Mr. Batcheller expressed his "polite regrets" that "it cannot accept Mr. Philip Murray's cordial invitation to go to hell." Mr. Murray, president of the United Steelworkers of America (CIO), made this observation in the same convention hall several weeks ago at the biennial meeting of his union.

H. W. Christensen, director of

purchases for the Columbia-Geneva Div. of U. S. Steel Co., was elected president of NAPA for 1952-53. He has been with Columbia-Geneva since 1933, director of purchases since 1939.

Mr. Swanton, former president of NAPA, was this year's recipient of the Shipman Award, presented annually "to one who by precept, example or distinguished service has contributed to the advancement of purchasing." The award includes a citation and gold medal. The Shipman Medal was founded by the Purchasing Agents Assn. of New York in 1930. Mr. Swanton has been chairman of NAPA's Business Survey Committee since 1947.

Next year's convention will be held in Los Angeles May 24 to 28.

METAL POWDER: '52 a High Valley

Business, off from peak of last year, well above average

... Lull considered temporary by confident industry ...

Expansion growing ahead of demand—By R. L. Hatschek.

Metal powder business is way off from last year's volume—but it's still high. The 1951 boom in powder usage distorts the current view. As one member of the trade put it, "You have to beat the previous year's sales before you can consider any year a good one. That's American business philosophy."

Actually, sales of iron powder this year are about 60 to 80 pct of the 1951 rate and they are still well above the average of earlier periods. Imports of Swedish iron powder are also off, running about 25 pct below last year's. That puts imports at about the 1950 level and better than double the 1949 rate.

If powder business were drawn on a graph, 1952 would be one of the highest valleys on record, preceded by a record peak.

Prime reasons for the lull, if you can call it that, are cutbacks in military schedules and the ending of consumer scare buying. The latter is causing manufacturers to reduce parts inventories. Many are worried about their own product sales with demand falling for some consumer goods.

Good Future—But powder people—both iron and other metals—are not crying the blues. Just the opposite, their optimism seems boundless. And with good reason, for the long-term trend is definitely toward greater use of metal powder fabrication. Everyone confidently terms the present a "temporary lull."

Producers are expanding facilities at a rapid pace—even faster than demand is growing. Hoeganaes Sponge Iron Corp., a Swedish firm, is currently building a plant in Riverton, N. J., for making powder from Swedish iron. Initial production is scheduled for Janu-

ary, 1953, and anticipated output will be approximately 30,000 tons annually.

Faster Acceptance—General feeling in trade circles is that metal powder has only scratched the surface of probable future applications. Industry acceptance of any relatively new process is always slow as individual companies investigate thoroughly. As a result, development of metal powder markets has been a little slower than anticipated—but it's still skyrocketing. Many manufacturers have sought out powder suppliers rather than the reverse.

At present, much development is being done by military ordnance departments. Powder fabrication is admirably suited to making small

arms ammunition and artillery shell components. But these programs have also been slow in developing.

The powder industry believes that it is better to have an ample supply and stay away from government control than to worry about over-production. Yet another reason for huge expansion is that the assurance of a plentiful supply can be a strong factor in attracting new customers.

Other strong factors are the advantages to be gained by producing parts of powdered metal. Complex and intricate parts can be formed generating little or no scrap. Time required for the production of parts is generally reduced and the more complex the part the more time is saved through the elimination of machining steps.

Powder parts can be varied in density and porosity. And the latter characteristic is extremely valuable in manufacturing bushings and all manner of bearings since the part can include oil or other lubricant. This can eliminate the need for periodic lubrication.

IRON & STEEL: April Output By Districts

As Reported to the American Iron & Steel Institute

DISTRICTS	Number of Companies	Annual Capacity	PIG IRON		SPIEGEL FERRO-MANGANESE		TOTAL			
			April	Year to Date	April	Year to Date	April	Year to Date	Pct of Capacity	
									April	Year to Date
Eastern.....	12	13,983,580	1,004,524	4,422,936	20,807	106,303	1,028,331	4,529,239	89.4	97.8
Pitts.-Yngstn....	17	27,468,600	1,941,864	8,711,081	14,095	92,779	1,955,959	8,903,860	86.8	96.9
Cleve.-Detroit..	6	7,501,100	529,181	2,279,525			529,181	2,279,525	86.0	91.9
Chicago.....	7	15,703,740	1,036,322	4,770,976			1,036,322	4,770,976	80.4	91.8
Southern.....	8	5,648,620	430,643	1,825,706	4,556	21,389	435,199	1,847,095	93.9	98.9
Western.....	3	3,476,700	242,662	1,118,358			242,662	1,118,358	85.1	97.3
Total.....	35	73,782,340	5,185,396	23,128,582	39,458	220,471	5,224,854	23,349,053	86.3	95.7

DISTRICTS	STEEL —NET TONS	Number of Companies	Annual Capacity	TOTAL STEEL (Incl. Alloy Steel, Carbon Ingots)		Pct of Capacity		ALLOY STEEL		CARBON INGOTS	
				April	Year to Date	April	To Date	April	Year to Date	April	Year to Date
Eastern.....	23	21,709,870	1,576,075	6,963,586	88.5	97.0	129,032	547,858	326,160	1,439,414	
Pitts.-Yngstn....	33	42,350,760	3,105,502	13,662,850	89.4	97.5	440,943	1,959,154	362,880	1,616,304	
Cleve.-Detroit..	8	10,485,380	813,230	3,385,502	94.5	97.6	60,297	232,955	78,706	350,150	
Chicago.....	15	22,258,500	1,583,422	7,266,378	86.7	96.7	116,121	560,234	233,773	1,108,372	
Southern.....	10	5,291,260	410,544	1,783,454	94.6	101.9	5,930	28,258	751	6,048	
Western.....	12	6,491,900	502,369	2,127,090	94.3	99.1	12,877	42,678	34,415	155,714	
Total.....	79	106,567,570	7,991,142	35,188,660	87.7	98.0	785,200	3,371,137	1,036,687	4,676,002	

* Revised.

STEEL: What's Next White House Move?

Administration digs deep in bag of tricks to meet checkmate from Supreme Court . . . Must face up to steel strike . . . Push for authority from Congress to seize steel—By G. H. Baker.

Overthrow by the Supreme Court this week of the Federal Government's turbulent 55-day reign in the steel industry met general congressional approval, though some lawmakers demanded legal seizure authority. Others asked use of the Taft-Hartley injunction.

Announcement of the history-making decision by the high court on Monday sent key congressmen and White House officials scurrying into closed conferences dealing with suggestions for ending the new strike.

Presidential assistant John R. Steelman (who also heads the Office of Defense Mobilization) quickly called a series of meetings of top Administration labor and

For news of steel strike progress and steel inventory reserves of manufacturers see the Iron & Steel Summary, p. 189.

legal aides to discuss the next White House move. One Administration plan involved petitioning the Supreme Court for a rehearing of the case. Actually, such applications are seldom granted by the court. Other plans involve new Wage Stabilization Board talks, but the form and type of any new talks had not been determined earlier this week.

At the Capitol, Mr. Truman's supporters in the Senate and in the House are pushing for early approval of new legislation which would authorize national seizure of the steel industry. In essence, their proposals parallel the World War I legislation that specifically authorizes seizure and operation of the nation's railroads.

Congressional comment on the court decisions significantly reflects the wide range of political thinking on steel seizure, and also serves to indicate the gaps that must be closed if Mr. Truman is to succeed in pressuring Congress into

legislating a seizure law.

"Most unfortunate," is the terse comment of Rep. Celler, D., N. Y. On the other hand, Sen. Tobey, R., N. H., tied up a large chunk of national feeling in a 1-word explosion: "Hooray!"

There are new demands in both upper and lower chambers for the White House to use the Taft-Hartley act. An informal check shows that even members who earlier had agreed with Mr. Truman in by-passing the 80-day cooling-off provision now feel that they can no longer ignore this law. They now reason that the White House must avail itself of every instrument at its command to assure the continued production of steel.

Secretary of Commerce Sawyer went through the formality of returning the mills to their private owners. On Monday he sent word to steel producers instructing them to post notices in all plants to the effect that the mills are no longer being operated by the government.

The Supreme Court announced its 6-3 decision as the first order of business on Monday. Justice Black delivered the majority opinion of the court. Siding with him

were Justices Jackson, Burton, Clark, Douglas and Frankfurter. The dissenting view was taken by Justices Vinson, Reed and Minton.

Justice Black, who delivered the majority opinion, said the constitution clearly delegates to Congress the power to make the laws and gives the President the job of enforcing them.

"The President's power to issue the order must stem from either an act of Congress or from the Constitution itself," he said. He added:

"There is no statute that expressly authorizes (the order) . . . nor is there any act of Congress to which our attention has been directed from which such a power can be implied."

No Seizure—It was pointed out that Congress had refused to write into the Taft-Hartley Act any seizure method for settling any labor disputes, obviously believing that such action would hinder instead of help collective bargaining.

This left it a question of constitutional authority, the majority ruled. There was held to be none, even implied, under the aggregate of powers granted in Article II.

"The constitution did not subject this lawmaking power of Congress to presidential or military supervision or control."

"Even though the threat of war be an expanding concept," the opinion declared, "we cannot with faithfulness to our constitutional system hold that the Commander-in-Chief of the armed forces has the ultimate power as such to take possession of private property in order to keep labor disputes from stopping production."

Need Authority—Justice Douglas said that conceivably the President might seize an industry if Congress ratified such an action, but "until and unless Congress acted no condemnation could be lawful."

The high court brushed off the government's contention that the steel industry had not made a case for possible irreparable damage.



"Sorry, no pets."

EXECUTIVES: Ways to Seek Them Out

Theme of Management Assn. session is selection, development of executives . . . Need is urgent . . . Manufacturing, industry's problems complex . . . Management methods—By T. Metaxas.

There were no sunburst-pattern ties in evidence at New York's Astor Hotel last week where hundreds of management people attended American Management Assn.'s briefing session on scientific methods in selecting and developing executives. Under the blackluster business suits beat the most progressive hearts in industry. These men (a few women) try to pin down the intangibles of human behavior and opinion to forecast management potential.

The climate of these rushed industrial times fashioned the subject of the session. Today's steep increases in productivity and complexity of running a business have inflicted on industry a much-lamented shortage of suitable executives. Unlike shortages of materials it cannot balance out by itself. Industry must keep its enlarged plant producing at optimum efficiency—especially when intensified competition is in view.

There was a class room air to AMA's management sessions, bordering on pure instruction. Speakers and audience were prolific with ideas and questions.

Still In Harness—Management experts warned that industrial growth is outstripping the current harvest of executives. Older men who should be thinking of retirement stay in the yoke. Executives must be "broader" men today. As manufacturing becomes more complex so do problems of dealing with more powerful unions, a more interested public, a government infected by determination to control. Narrow concepts of doing business have been breached.

Management people were told that responsibility for a development program should be borne solely by the top executive, who should see to it that subordinates carried the plan through.

Vigorous emphasis was put on

the value of appraising an individual's worth as management material. Psychological tests are but the forerunner to appraisals of individuals by their superiors and people who work around them. Plants must study potential expansion and with this yardstick gage how many new executives will be needed.

Scientific appraisal of future executives naturally leads to establishment of an executive inventory system through which the company knows what it has on hand and how healthy is its management depth.

Standards — To measure the worth of executive prospects, clear-cut performance standards and scoring language must be established. Findings of appraisals can be discussed with the individual involved and his superiors to find ways of coaching him to complete management eligibility.

A talk on group appraisal of individuals by several executives created a mild hub-bub of questioning. Group discussion of merits and demerits of management possibles yields a fuller picture of the subjects—meanwhile crowding out personal prejudice or just plain misinformation. Domination of the group by the boss should be conscientiously avoided.



Management is putting more faith in the consultative or conference method of management guidance. Executives learn from each other, understand better the functions of other departments.

For Select Few—The most painstaking method of coaching described at the meeting was one in which a direct superior rates his subordinate daily, pinpointing weaknesses, and then creating challenging situations to purge the flaws. This way cannot be applied on a mass basis because of the time drain it imposes on valuable people. Individual coaching in the natural flow of industrial activity is a less-trying, long-term method.

THE IRON AGE learned that management men are aware that theirs is a young science. It is making much progress but is still enmeshed in theory and experiment, doesn't have the benefit of too many fully tested precedents.

Some companies have rugged individualist bosses who instinctively react against sound management planning. Sometimes they tend to pattern new executives after themselves no matter how unsatisfactory the mold. Plant politics is also not to be discounted in considering appraisals.

Ignoring Jones—Holding good men back is not rare even today when executives are being upgraded to meet the stress of heavier production. Suppose that Jones is doing such an excellent job in running his department that "Z" company cannot find his peer. The firm may try to eat its cake and have it too by hiring an outside man for the overhead vacancy, leaving the incomparable Jones stalemated.

Discussing findings of appraisal reports with the employee is a valuable way of correcting faults. Most executive-type men want this privilege. But glad-handing a man with a fairly good report into believing that he will be president tomorrow is a misstep in diplomacy. Too many blunders like this, too many men left dying on the vine can spread bad morale.

METALS: Good Supplies Forecast

Jess Larson sees adequate stocks of almost all minerals . . . Further government production not needed . . . Financial "helping hand" only policy is advocated—By A. K. Rannels.

Adequate supplies of metals and nearly all minerals are now in sight—and without any further extension of government activity in the production end of the affected industries.

This is the expressed belief of Jess Larson, government housekeeper and boss of defense materials procurement. He says "substantial progress" is being made toward meeting presently foreseen requirements for defense and most civilian needs.

Larson indicates that as far as he is concerned expansion is industry's business, and the government should confine its interest to lending an occasional helping hand, when the need for it is clearly indicated.

"By the time production now scheduled or in prospect is in full swing," Larson says, "we will not only be able to meet defense needs but it will be possible to supply substantial amounts for civilian requirements."

Helping Hand—A helping hand is defined by the purchasing chief as issuance of tax certificates, purchase contracts, advances when needed against production, and some loans—"to the end that industrial expansion, which is going to occur eventually, occurs sooner."

It also involves the government's sharing of exploration and development costs of likely-looking new mines and potential mineral-bearing regions.

So far, the Defense Materials Procurement Agency has received approximately 1625 requests for the helping hand. Of these, 455 were later withdrawn and 605 turned down by the agency. Some 370 have been approved. There are 246 exploration projects for 22 strategic minerals and at least 27 guaranteed market contracts for copper, lead, zinc, cobalt, manga-

nese and titanium. Others are now under consideration to determine their eligibility for aid.

Status—A partial summary of the basic information for the DMPA outlook, as well as how the government is extending its helping hand, is roughly as follows:

Iron Ore—Considerable increase in production is needed for increased steel capacity of 120 million tons. DMPA has recommended certificates of necessity for ore output expansion by 43 million tons and taconite beneficiation by 15 million tons by 1955. Through May 25, 106 fast tax write-off certificates had been issued for 41 million tons of iron ore and 7 million tons of taconite. Other ore developments are also being conducted overseas.

Copper—Needs by 1955 are estimated by the government at 2,270,000 tons as compared with 1,914,000 tons available last year. Production of domestic refined copper amounted to only 951,000 tons in 1951 and DMPA sees the shortage ending by 1955. DMPA

has issued five "maintenance-of-production" contracts, six purchase contracts, 12 certificates of necessity, and one loan. This is estimated to increase domestic refined copper by 270,000 tons. With scrap and imports, total red metal supply should be well above requirements.

Lead—Some 22 certificates of necessity have been issued as well as one purchase commitment for foreign supplies. These are expected to result in an increase of 195,000 tons of additional production above the pre-Korean consumption of 1,250,000 tons.

Zinc—Assistance has been given producers in the form of 34 certificates of necessity, eight purchase commitments, and three loans. Production increases of 115,000 tons this year, 175,000 tons next year, with a cumulative increase of 850,000 tons through 1956 are hoped for.

Nickel—Jet programs require much more nickel than the pre-Korean consumption of 101,000 tons. Opening up the Nicaro plant is expected to boost supplies by 15,000 tons. Issuance of four purchase contracts and one certificate of necessity should add another 14,000 tons.

Chrome—One purchase depot has been set up to buy chrome ore at a premium price and one commitment-to-purchase contract has been made for delivery of 900,000 tons of ore over a 5-year period.

Manganese—Three buying depots have been set up and nine tax amortization certificates, one purchase contract, one loan, and several advances against production have been issued. Expansion is estimated at 1 million tons.

Titanium—Incentives have been issued in the form of three certificates of necessity, one commitment to purchase, and the setting up of a revolving fund for short-term purchase. Output is expected to increase from 500 tons last year to 7500 by 1955.



"Only bright spot is that our scrap output is higher this month than last."

APPLIANCES: Market Stays Sickly

Reg. W relaxation helps some, but not much . . . Distributors not planning inventory boosts . . . Manufacturers fear higher steel, labor costs . . . Stocks remain good—By K. M. Bennett.

The outlook for home appliance sales remains moribund. The appliance industry, despite relaxation of Regulation W, is still in the process of slowing down.

It is true that sales rose after the regulation was cancelled. A conservative 15 pct rise in middle income buying was reported by one large distributor of home appliances.

Nonetheless, appliance buyers are not eager to move in on this new sales rise. When sales began their upward movement 4 weeks ago, buyers who knew that they must make commitments for a period 3 to 6 months in the future made no plans for any increased inventory. Those with fairly large supplies of washers, ironers, ice-boxes are paring them cautiously.

Good Supply — Manufacturers' inventories are still large. Distributors too are amply equipped for any extended run of sales. It's been necessary to offer higher trade-in values on old equipment, spruce up selling campaigns, and offer such tidbits as a year's supply of laundry soap.

Purchasing agents of large distributors are not sanguine. Their feeling is that increasing labor and steel costs will eliminate any price declines at the factory level. They suspect that it will be up to the distributor to absorb any necessary price drops in an increasingly competitive market. They do not regard the current up trend as indicating a strong market for late third and fourth quarter.

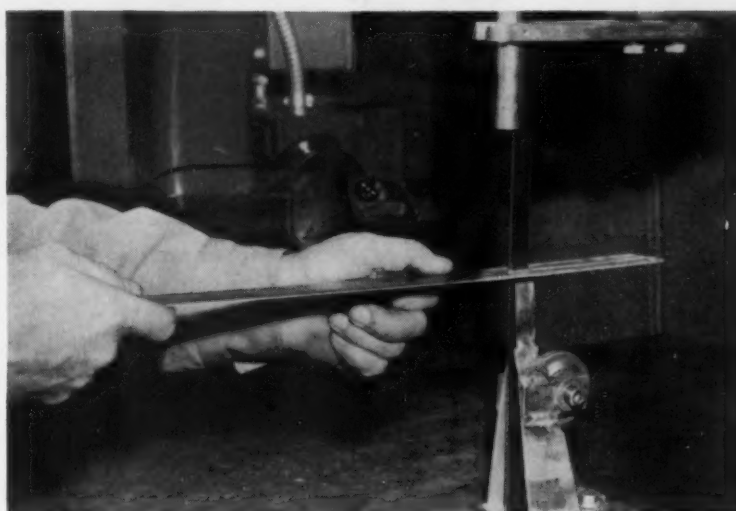
Though purchasing agents feel they are more directly in touch with market conditions than the manufacturer, manufacturers seem fully cognizant of the appliance lull. Layoffs of 900 and 1200 workers occurred within the last week.

Price cuts of up to \$45 are being discussed, and at the distributor level, trade-ins of up to \$50 are available.

The appliance market is expected to become increasingly competitive, and price markdowns will

have an odor of blood about them. Fall price planning, despite the background of guarded pessimism, will even require markups in certain lines. A popular brand of sewing machine is destined to put a larger bite on the housewife's budget, for example.

There are reports that appliances have been made available on consignment. This would mean the manufacturer was merely expanding his inventory space to include the warehouses of his distributors.



Toothless Saw Made From Steel Strapping

Anxious to cut its \$2500 monthly band saw blade bill, Solar Aircraft Co., San Diego, is using a toothless saw blade made of ordinary steel box strapping which saws through stainless steel and high alloy sheets.

Toothless sawing cuts down purchases of expensive saw blades and could reduce use of strategic metals in commercial blades. It is also expected to decrease industrial accidents since the strapping blades do not break so easily as conventional types.

Solar reports it was paying more than \$3 for each of its ordinary band saw blades. They lasted less than 2 hr. Steel box strapping to make one band saw blade costs about 10¢. In actual sawing operation the blades have lasted as long as 29 hr. Toothless spring steel blades costing slightly more than 50¢ lasted over 70 hr.

High Speed—The toothless sawing method is most efficient at high speeds. Friction sawing heats the metal being cut to the melting point so that the blade literally burns its way through. Conventional blades are equipped with teeth on the theory that they speed burning action by bringing oxygen to the metal. Solar discovered that its toothless blades were roughened in the first two seconds of operation.

COPPER: Pricing Still Confused

Industry rejects government's proposed changes in red metal prices . . . Ask complete removal of all price controls . . . Plan is called unworkable, unfair—By A. K. Rannells.

Industry turned a cold shoulder to the government's first proposal to solve the problem of giving everybody an even break under officialdom's lopsided copper pricing setup.

Nothing short of complete removal of all price controls will solve the whole copper supply-and-demand problem, industry representatives state.

Removal of price ceilings from imported copper while retaining fixed prices for domestic production was the cause of the complicated situation.

This meant that 80,000 tons of permitted monthly consumption would be bought at 24½¢ per lb but the remaining 50,000 tons, or 40 pct, would cost whatever the traffic would bear.

Allowing the mills to pass on 80

pct of the extra cost above the previous import ceiling of imported copper only added to the complicated problem of trying to equalize prices for fabricators and ultimate consumers.

40 Pct Imported—Last week National Production Authority proposed that all domestic users of refined copper should accept 60 pct of their allocations in domestic metal and take 40 pct in the higher priced foreign metal.

In the meantime, the agency said, it would amend M-16 so as to allow 75 pct a month in advance allotments for 2 months for domestic copper and perhaps 100 pct for foreign copper.

Members of the various copper industry advisory committees said this secondary move would be all

right but it wouldn't help the pricing problem. Proposed NPA solution was both clumsy and unworkable, they said.

Forced Sale—It would mean, in effect, that the big domestic producers would be prohibited from using a large amount of their production in their own fabricating plants. They would have to sell up to as much as two-fifths of their production to brass and wire mills of their competitors at the ceiling price of 24½¢ and replace it with the higher-priced imports.

This would not only be unfair but it is questionable as to legality, say the larger producers. They contend that the only answer is removal of all price controls from scrap to refined copper.

Industry has also suggested as an alternative to pricing decontrol that the government buy all copper, both domestic production and imports, and sell it back to the mills at an average price.

Still a third proposal was that the government buy the imports and sell it to industry at the do-

Summary of NPA Control Actions

First Quarter 1952

REVOCATIONS

M-92—Starting, Lighting and Ignition; Electric Storage Batteries—Feb. 26, 1952.

M-68—Passenger Cars—Mar. 14, 1952.

M-59—Strapping—Mar. 25, 1952.

CMP Reg. 1, 10—Restrictions on Steel Shipments and Acceptance of Deliveries; Dir. 10A—Shipments of Steel by Controlled Materials Producers—Apr. 11, 1952.

M-75—Steel Shipping Drums—Apr. 29, 1952.

M-45, Sched.—Sebacic Acid—Apr. 30, 1952.

RELAXATIONS

M-2, Amended—Rubber—Jan. 1, 1952.

NPA Reg. 2, Dir. 3—Restrictions Upon Use of Ratings—Jan. 8, 1952.

M-25, Amended—Cans—Jan. 22, 1952.

CMP Reg. 1, Dir. 9—Non-Nickel-Bearing Stainless Steel—Jan. 28, 1952.

M-2, Amend. 1—Rubber—Feb. 4, 1952.

M-38, Amended—Lead—Mar. 3, 1952.

M-24, Amended—Tin Plate and Terneplate—CMP Reg. 6, Revised—Construction—Effective Mar. 12, 1952.

M-25, Amend. 1—Cans—Mar. 13, 1952.

M-19, Amended—Cadmium—Mar. 13, 1952.

CMP Reg. 4, Amended—Deliveries of Controlled Materials by Distributors—Mar. 21, 1952.

M-2, Amended—Rubber—Mar. 26, 1952.

M-29, Amended—Automobile Wreckers—Mar. 26, 1952.

CMP Reg. 5, Dir. 1, Amended—Acquisition of Certain Materials as MRO Regardless of Established Accounting Practices—Mar. 26, 1952.

M-46A, Amend. 1—Priority Assistance for Foreign Petroleum Operations—Mar. 31, 1952.

M-67, Amended—Aluminum Foil, Converted—Apr. 1, 1952.

CMP Reg. 1, Dir. 10A—Shipments of Steel by Controlled Materials Producers—Apr. 8, 1952.

M-92, Dir. 1—Temporary Exemption of Auto Wreckers in Certain Areas from Purchase Limitations—Apr. 14, 1952.

M-47B, Amended—Use of Controlled Materials in Certain Consumer Durable Goods—Apr. 15, 1952.

M-99, Amend. 1—Cryolite—Apr. 15, 1952.

M-27, Amended—Collapsible Tubes—Apr. 16, 1952.

M-73, Amended—Rail Systems MRO—Apr. 16, 1952.

M-74, Dir. 1—Use of Copper and Copper-base Alloy in Inventory as of July 1, 1951—Apr. 17, 1952.

M-2, Amended—Rubber—Apr. 21, 1952.

CMP Reg. 1, Dir. 3, Amended—Restrictions on Placing Authorized Controlled Materials Orders—Apr. 23, 1952.

M-26, Amended—Packaging Closures—Apr. 24, 1952.

NEW CONTROLS

M-6A, Sched. 2—Steel Distributors—Jan. 1, 1952.

M-69, Amended—Sulfur—Jan. 1, 1952.

M-94—Sulfuric Acid—Jan. 1, 1952.

M-95—Railroad Transportation Equipment—Jan. 4, 1952.

NPA Reg. 6, Amend. 2—Inventory Control—Jan. 28, 1952—Added Rutile.

M-97—Lighting Fixtures: Limitations on Use of Copper—Feb. 1, 1952.

M-98—Used Cans for Copper Production—Feb. 14, 1952.

M-99—Cryolite—Feb. 29, 1952.

M-101—Certain Used and Imported Metal-Working Machines—Mar. 7, 1952.

M-102—Crushing Bort and Diamond Powder or Dust, and Unreclaimed Diamond Material—Mar. 13, 1952.

M-103—Diamond Grinding Wheels—Mar. 13, 1952.

M-1, Dir. 5—Production of Light Gage Plate on Wide Plate Mills—Apr. 3, 1952.

CMP Reg. 1, Dir. 10—Restrictions on Steel Shipments and Acceptance of Deliveries—Apr. 7, 1952.

M-104—Metal-working Machines—Finishes—Apr. 9, 1952.

CMP Reg. 6, Dir. 2 Amended—Reconstruction or Repair of Disaster Damage—Apr. 17, 1952.

M-41, Amended—Metalworking Machines—Delivery—Apr. 18, 1952.

M-47B, Dir. 1—Exclusion of New Products from Flexibility Provision—Apr. 28, 1952.

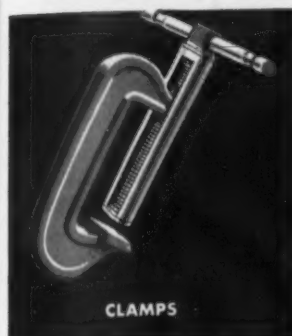
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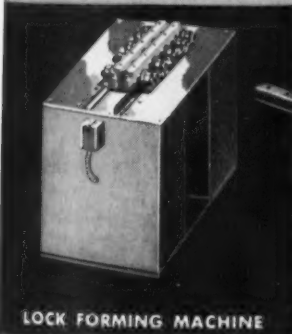
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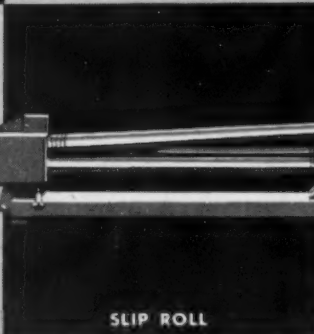
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Controls

mestic ceiling price. This is conceded no chance since it is a subsidy proposition and probably would require legislation to provide the funds.

But over the weekend, control officials were still standing by their statements that no such actions are "being contemplated."

CMP:

Third-quarter allotments boosted for non-military durable goods.

Third-quarter controlled materials allotments for non-military production are being boosted 10 pct for steel, 15 pct for copper, and 50 pct for aluminum, according to the latest pronouncement by National Production Authority.

This means that generally consumer durables manufacturers will be allowed 55 pct of their pre-Korean steel usage, 35 pct of brass mill and copper foundry products, 40 pct of copper wire mill products, and 45 pct of aluminum.

At the same time, the agency increased the minimum level for brass mill and copper foundry products allotments from the existing 10 pct of base period to 20 pct.

Substantial amounts of steel and aluminum, and a smaller percentage of copper, have been put in reserve for supplementary allotments. Manufacturers whose third quarter allocations are so low as to work hardship should file applications at once—as these will be taken up in order of receipt.

Essential—Maximum allocations under the rule-of-thumb percentage standard will be given for a group of consumer durables generally regarded as essential. These include refrigerators, washing machines, vacuum cleaners, home freezers, lawnmowers, home workshop tools, and varied other items.

Another group, however, will be limited largely to the minimum of 20 pct of base period consumption of brass mill and copper foundry products.

These items include furniture, radios, television, sporting goods.

toys, specialized hardware such as fireplace equipment, wheeled goods, except baby carriages, and so on.

This group of manufacturers are promised generous treatment in the way of extra carbon steel and aluminum, however, if these can be substituted for the low copper and brass allowances.

For those who cannot possibly substitute because of cost or technical problems, NPA says it will screen supplementary applications very carefully. It will try to release some metal from its small copper and brass mill products reserve.

Brass Mill Buyers Get Priorities

National Production Authority last week amended orders M-82 and M-86 so as to permit distributors of brass and copper mill products sold for military, atomic energy, and machine tool programs to compete successfully at the mill level for replacement materials.

Specifically, distributors who filled authorized controlled materials orders bearing A, B, C, E, Z-2, or (the suffix) B-5 symbols can attach the B-5 symbol (reading X-6-B-5) to their own orders for the military business involved.

Industry Controls This Week

Aircraft—Amend. 19, GOR 9 removes price controls from sale of used aircraft and from licensing right to manufacture aircraft and aircraft parts.

Brass, Copper—Amends. to M-82 and M-86 enable distributors of brass mill products and copper wire mill products to replenish inventories with materials sold for military, atomic energy or machine tool programs.

Capehart Adjustments—Amend. 3, SR 17, CPR 22 simplifies Capehart-type ceiling price adjustments for manufacturers who were not in business before Jan. 1, 1950.

Coke—Amend. 8, SR 13 extends indefinitely price controls on coke, coal chemicals, and coke and oven gas.

Used Machine Tools—Amend. 1, CPR 80 provides alternate methods for determining price ceilings of used machine tools.



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Defense Contracts

Lighter, Barge Contracts Awarded

Ten companies, nine of them in the small-business category, are handling contracts amounting to \$4.5 million for construction of 66 lighters and barges to be placed in service by Army Transportation Corps and the Air Force.

Awards were made by the Navy, which invited 170 firms to bid on the six lighters, intended for Air Force use. The barges, all of them ordered for the Army, will be steel craft ranging in length from 110 to 235 ft.

Portland Tug and Barge Co., Portland, Ore., and Burtin Construction and Shipbuilding, Port Arthur, Tex., are building the lighters.

Participating in barge construction are:

Higgins, Inc., New Orleans.
Gunderson Bros. Engineering Corp., Portland, Ore.
Northeastern Boiler & Welding, Ltd., Green Bay, Wis.
Albina Engine and Machine Works, Portland, Ore.
E. W. and A. P. Dupont, Inc., Morgan City, La.
Laris Painting, Inc., Laris Ship Repair Div., Green Cove Springs, Fla.
Reliable Welding Works, Olympia, Wash.
Guntert and Zimmerman, Stockton, Calif.

Navy Seeks Wind Tunnel Bids

Bids are being sought by the Navy for construction of a U-shaped tunnel tube, 574 ft long, as the final building segment of a facility for high-speed testing of model aircraft at David Taylor model basin, Carderock, Md.

Reinforced concrete with steel contraction and diffuser cones will be used for the major part of the tunnel. Actual tests will be performed in a 7x10-ft steel "throat" of the tunnel.

Tunnel structure, on which the Navy anticipates completion next year, will vary internally from a circle of 19 ft to a square of 33 ft. It must be suitable for operation at working pressures varying from 7 psi to 30 psi.

Cooling equipment will be placed in a 54-ft end section and will utilize water to be circulated at 14,000 gpm from cooling towers and a reservoir adjacent to the tunnel.

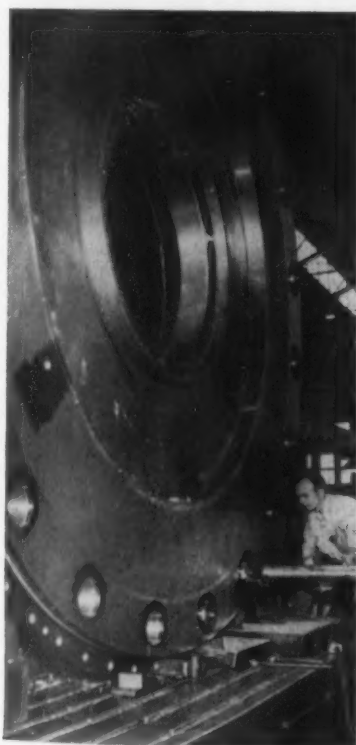
Military Bid Dates Coordinated

Bid-opening dates for military construction projects costing \$1 million or more are now being coordinated by Army Engineers and Navy Bureau of Yards and Docks.

This procedure, the services feel, will prevent conflicts which could arise when bids from the same general pool of contractors are opened on identical or nearly identical dates. Plan would allow spacing of the dates to permit a 2 or 3-day interval after each.

Both the engineers and BuDocks expect to let a large number of major construction contracts during the next few months. Air Force construction handled by the Army is included in this schedule.

Dates for opening bids on engineer civil works projects will not be coordinated directly with other armed forces agencies. However, the engineers will take into consideration bid-opening dates already established for military construction work.



GATE CONTROL: Headcover for a 1800-hp turbine for the Fort Gibson, Okla., project is bored for gate stem bushings at Baldwin-Lima-Hamilton Corp. in Philadelphia.

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Defense Contracts

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

Ordnance Tank Automotive Center, Detroit.
Shaft input w/integral gear mfrs, 12606, 52-3793B, June 9.
Gear transfer idler shaft, 2500, 52-3793B, June 9.
Trailer bomb 2-ton four-wheel, 800, 52-4064B, June 11.
Kit repair water pump seal, 8000, 52-4035B, June 17.
Retainer eng water temperature thermostat, 60000, 52-4035B, June 17.
Stud eng cyl hd, 125000, 52-4035B, June 17.
Pump oil assy, 100000, 52-4035B, June 17.
Muffler, eng exhaust assy, mfrs, 16000, 52-4035B, June 17.
Gun, lubricating push type, 37700, 52-3895B, June 11.
Stud RR axle drive shaft, 80000, 52-3571B, June 17.
Connector assy, 1100, 52-3573B, June 17.
Shaft trans reverse idler, 25000, 52-3573B, June 17.
Screw mach, 62000, 52-3009B, June 9.
Sleeve eng cyl, 25000, 52-3741B, June 11.
Fixture crkshaft & flywheel, 1500, 52-3629B, June 4.
Adapter puller, 1900, 52-3629B, June 4.
Sleeve eng cyl, 18607, 52-3117B, June 12.
Piston assy, 2600, 52-3117B, June 12.
Piston assy. std, 1800, 52-3117B, June 12.
Trailer mount M20, 1203, 52-3393B, June 4.
Kit, repair hydrovac cyl, 52800, 52-3938B, June 5.
Control, choke assy, 104000, 52-3908B, June 12.
Shaft shifter transfer, 1500, 52-3827B, June 5.
Shaft shifter, 15000, 52-3827B, June 5.
Puller steering ball crank shaft, 1615, 52-3713B, June 5.
Wrench gen. and starter nut, 1627, 52-3620B, June 5.
Wrench spanner hook, 1314, 52-3620B, June 5.
Wrench spark plug, 5968, 52-3620B, June 5.
Extension lubricating gun, 36560, 52-3529B, June 5.
Starter assy, 2200, 52-3697B, June 14.
Radiator assy, 2000, 52-3614B, June 14.
Horn assy, 6 volt, 82500, 52-3838B, June 7.
Wrench track adj. box hex, 3300, 52-3620B, June 5.
Valve engine crankcase ventilator assy, 15000, 52-3871B, June 16.
Wrench cyl hd nut long, 1000, 52-3620B, June 5.
Wrench final drive, 1000, 52-3620B, June 5.
Wrench fuel valve seat, 1000, 52-3620B, June 5.
Wrench spark plug double end, 1000, 52-3620B, June 5.
Wrench tubular prolonged, 5000, 52-3620B, June 5.
Wrench wheel bearing nut, 8000, 52-3620B, June 5.

Corps of Engineers, Philadelphia.
Extinguisher, fire water-pump, 9000, Eng-26-109-52-533B, May 26.

Detroit Arsenal, Centerline, Mich.
Strip track steel, 19300 ea, 52-291B, June 16.
Kit, track shoe, 55832, 52-291B, June 16.

Transportation Corps, Supply Field, Marietta, Pa.
Railway car-refrigerator-mechanical, 135 ea, 54B, June 17.

New York Quartermaster, New York.
Machine, stapling, 84340 ea, 52-1830B, June 20.

Springfield Armory, Springfield, Mass.
Spring buffer, 55000 ea, 52-326B, June 9.
Spring change lever stop, 45000 ea, 52-326B, June 9.
Plate butt inner assy, 1500 ea, 52-325B, June 9.
Spring bolt guide, 50000 ea, 52-326B, June 9.
Pin retaining gas cylinder, 72000 ea, 52-328B, June 9.
Pin retaining gas piston, 30000 ea, 52-325B, June 9.
Pin lock body, 410000 ea, 52-328B, June 9.

Contracts Reported Last Week

Including description, quantity, dollar value, contractor and address:

Spare parts, var, \$70,246, Wooldridge Mfg Co., Sunnyville, Calif.
Spare parts, var, \$93,346, The Heil Co., Milwaukee.
Spare parts, var, \$32,906, Briggs & Stratton, Milwaukee.
Spare parts, var, \$711,492, Hercules Motors Corp., Canton, Ohio.
Spare parts, var, \$49,971, Climax Engine & Pump, Clinton, Iowa.
Spare parts, var, \$144,464, International Harvester, Melrose Park, Ill.
Spare parts, var, \$33,028, Littleford Bros., Inc., Cincinnati.
Spare parts, var, \$63,308, Daybrooke Hydraulic Corp., Bowling Green, Ohio.
Pumps, fire and fire standby, 8, \$31,928, Ingersoll-Rand Co., Washington.
Metal parts for shell smoke, WP, 57MM, \$20,000, \$545,110, G.M. Co. Mfg., Inc., Long Island City, N. Y.
Canister, smoke, WP, 55000 ea, \$406,881, John E. Mitchell Co., Dallas.
Shell, HE M1 105MM, 50000, \$475,875, Chamberlain Corp., Waterloo, Iowa.
Shell, HE 105MM M1, 163000, \$1,302,370, Altorfer Bros. Co., East Peoria, Ill.
Primer percussion, 5000, \$113,750, Langson Mfg. Co., Chicago.
Carriage motor, \$69,634,545, Massey Harris Co., Racine, Wis.
Tank, med, 8, \$29,701, Bowen-McLaughlin-York, Inc., York, Pa.
Spare parts, gun, 20MM, M3, 40, \$601,590, Crown Cork & Seal Co., Baltimore.
1,100,000 Steel Cartridge Corp., \$127,490, L. E. Zurbach Steel Co., Somerville, Mass.
250,000 cylinder gas assy, \$945,000, Tool & Metal Spec. Mfg., New York.
45,000 regulator gas cylinder assy, \$33,750, Tool & Metal Spec. Mfg., New York.
Gun parts, B.A.R., Cal. .50, \$74,000, Tool & Metal Spec. Mfg., New York.
20,000 tube, gas cylinder, \$308,400, Needham Mfg. Co., Needham Heights, Mass.
24,732 hider flash, \$40,807, The Hart Mfg. Co., Hartford.
65,000 bolt, assy, 20,000 lock, bolt, \$1,017,250, United Auto Eng. Co., New York.
Var items of spare parts, \$45,416, Garwood Industries, Chicago.
Carrier, hybrid CF-7, maintenance parts, \$62,1 lot, \$185,735, Lenkurt Elec. Co., San Carlos, Calif.
Gun, auto, 20MM, M24A1 and concurrent spare parts, 4259, \$4,179,956, Buffalo Arms, Inc., Buffalo.
Metal parts for supp. charge, deep cavity shell, 30005, \$147,705, Otto Berns Co., Inc., Rochester.
Replenishment of Motor Vehicle Parts, 24000 ea, \$30,240, Ainsworth Mfg. Corp., Detroit.
Replenishment of tank & combat vehicle parts, 450 ea, \$38,925, Aircraft Tool & Mfg. Co., Vassar, Mich.
Replenishment of tools, 3614 ea, \$31,785, Alford-Polk Tool Co., Millersburg, Pa.
Replenishment of motor vehicles, 11800 ea, \$269,774, Bendix Westinghouse Auto Air Brake Co., Elyria, Ohio.
Replenishment of motor vehicle parts, 42 ea, \$48,300, Ben's Truck Parts, Tacoma, Wash.
Replenishment of tools, 1580 ea, \$146,940, Topper Equip. Co., Mattawan, N. J.
Replenishment of Tank & combat vehicle parts, 1000 ea, \$27,200, Deubel Art Tool & Machine, Detroit.
Replenishment of motor vehicle parts, 1150 ea, \$37,634, Diamond T Motor Car, Chicago.
Replenishment of motor vehicle parts, 9620 ea, \$79,297, Federal Motor Truck Co., Detroit.
Replenishment of motor vehicle parts, 585 ea, \$84,906, Garwood Industries, Inc., Wayne, Mich.
Replenishment of motor vehicle parts, 14000 ea, \$26,600, GMC Truck & Coach Div., Pontiac, Mich.
Replenishment of motor vehicle parts, 5250 ea, \$98,913, Hercules Motors Corp., S. E. Canton, Ohio.
Replenishment of tools, 70 ea, \$25,436, Amer. Brake Shoe Co., Rochester.
Replenishment of motor vehicle parts, 660 ea, \$30,477, Kenworth Motor Truck Co., Seattle, Wash.
Replenishment of motor vehicles, 3800 ea, \$35,658, Mackenzie Awning Co., Detroit.
Replenishment of hardware, 225000 ea, \$52,965, Manhattan Lighting Equip. Co., New York.
Replenishment of motor vehicle parts, 13000 ea, \$82,550, Northwestern Auto Parts Co., Minneapolis.
Replenishment of tools, 5600 ea, \$194,320, Prevost Forged Products, Detroit.

A regular service of The **COOPER ALLOY** Foundry Co., Hillside, N. J.



TECHNICAL TOPICS

ALLOY TYPE 25-12

Norman S. Mott

Chief Chemist and Metallurgist

Alloy type 25-12 (CA22) is mainly a heat resisting alloy, although in the low carbon grade, with or without columbium or molybdenum, it is often used for its corrosion resistance. It is the most economical alloy for high temperature structural applications, such as tube supports, dampers and general furnace parts. In gas carburizing and bright annealing or hardening atmospheres its resistance is excellent and its resistance to high temperature air oxidation and to the corrosive action of high sulfur fuel flue gases is outstanding.

The 25-12S, 25-12SCb and 25-12SMo grades give excellent service in the sulfite pulp industry; and offer high resistance to nitric, phosphoric, dilute sulfuric and hydrochloric acids, as well as to organic acids such as citric, tartaric and lactic. 25-12S has better corrosion resistance than 19-9S, with carbon not being so critical. This holds for use in dilute sulfuric and hydrochloric acids at all temperatures, and in nitric acid at all concentrations and temperatures. In fact, in the boiling 65% nitric acid test 25-12S as cast is as good as 19-9S in the water quenched condition. The addition of molybdenum makes this alloy remarkably resistant, and its superiority in hot dilute sulfuric and hydrochloric acids over 19-9SMo is considerable. This suggests its use over 19-9SMo in some of the more exacting applications not necessitating the use of expensive FA-20 type alloy.

A.S.T.M. Specification B190-45T classifies the 25-12 alloy into two categories according to magnetic permeability: Type I, having a range of 1.05-1.7 and Type II, having a maximum of 1.05, after holding for 24 hours at 2000°F. and

water quenching. Since strength and ductility vary inversely at high temperatures, Type I containing ductile ferrite is able to resist fracture due to sudden overloads by yielding slightly under these stresses, but it has relatively low creep strength. Type II is completely austenitic and has high creep strength under conditions of constant loading, but is not as resistant to sudden shock.

Of major importance in heat applications is the influence of structure on its properties. The amount, form and distribution of the carbides affect strength and ductility and are determined by the percentage of carbon present in the alloy, the temperature, and the time of holding. Of perhaps greater importance is the presence of ferrite in the structure. While it enhances ductility at elevated temperatures after short-time aging, it must be discounted if the alloy is to be exposed for extended periods at the intermediate temperature range of 1200-1700°F., as this range favors the formation of a sigma phase which is hard and brittle. Its presence may result in reduced strength, ductility, and especially thermal fatigue cracking resistance. Thus there is much less tolerance for suddenly applied stress overloading or rapid temperature changes. Continued service about 1700°F. precludes this sigma formation.

To estimate ferrite on the basis of chemical analysis the Alloy Casting Institute suggests the following formula:

$$\frac{R.F. = [\%Cr + 3 (\%Si - 1)] - [\%C \times 16]}{\%Ni}$$

A ratio factor less than 1.7 denotes a negligible amount of ferrite or sigma and corresponds to the A.S.T.M. limit in permeability value of 1.05. A ratio factor of 1.7-1.85 denotes 2-7%, and a ratio factor about 1.85 denotes above 7% of ferrite or sigma.

Copies of this article reprinted on heavy stock for convenient filing are available on request.



The **COOPER ALLOY** Foundry Co., Hillside, N. J.

How leading plate glass maker cut cost 5 ways by solving handling problem



EDMONT CASE NO. 209

Problem: How to prevent accidents and improve production efficiency in the manufacture of window glass, an extremely sharp-edged, slippery and fragile material handled in large sheets which must be cut and stacked by hand.

Management Solution: On-the-job tests proved that fabric gloves coated with rough-finished natural rubber on palm and thumb gave workers positive non-slip grip on sheet glass, with maximum protection against cutting injuries; also wore several times longer than other type gloves. (Company name on request.)

Count these 5 cost savings, available wherever sharp, abrasive or slippery materials are handled, with or without the presence of heat, oil, acid, caustic, solvents or degreasants:

- 1: Fewer lost-time accidents
- 2: Faster, surer work handling
- 3: Less spoilage
- 4: Improved job attitude
- 5: 40% to 70% saving in usual glove cost to companies or employees.



**There's a correct glove for every job
Good management makes it available**

To meet different service requirements—tough coatings of NEOX (specially reinforced neoprene), natural rubber or vinyl plastic, bonded to comfortable, sweat-absorbing, insulating fabric.

We offer consulting service on specific problems or complete plant surveys: (Used by Pittsburgh Plate Glass, Bethlehem Steel, Goodyear, Packard, many others.)

Without cost or obligation we will gladly study your hand-protection problems and practices, make recommendations and furnish the procedures and materials for complete on-the-job tests. For full information, write our Safety Engineering Service.

Edmont

Edmont Manufacturing Company
1234 Walnut Street, Coshocton, Ohio

World's largest maker of coated industrial gloves

Construction

Steel Inquiries and Awards

Fabricated steel awards this week include the following:

- 700 Tons, North Chicago, Ill., Abbott Laboratories to Hansel Elcock Co.
- 700 Tons, Sao Paulo, Brazil, buildings for Sao Paulo Light and Car Power Co. through Stone and Webster Engineering Corp. Inc. to Bristol Steel and Iron Co., Bristol, Va.
- 570 Tons, Laramie County, Wyo., Bridge Fe-138/15/ to Pittsburgh Des Moines Steel Co.
- 220 Tons, Decatur, Ind., Bridge Fe-8 to Pittsburgh Des Moines Steel Co.
- 175 Tons, Freeport, Texas, power plant extension for Dow Chemical Co. through Stone and Webster Engineering Corp. Inc. to Mosher Steel Co., Houston, Texas.

Reinforcing Bar Awards this week include the following:

- 650 Tons, Great Lakes, Ill., Warehouse to Corbetta Construction Co.
- 575 Tons, Des Plaines, Ill., upper Des Plaines Sewage, to Great Lakes Dredge and Dock Co.

Reinforcing Bar Inquires this week include the following:

- 225 Tons, New Haven, Ind., Ordnance Plant.
- 227 Tons, Allegheny County, Pa., retaining wall and roadway embankment, Pennsylvania State Department of Highways, Harrisburg, Pa. Bids to June 20, 1952.
- 220 Tons, Newbury, West Newbury and Newburyport, Mass., construction of limited access highway with bridges in Newbury and Newburyport. Charles A. Fitz, Beverly, Mass., district engineer. Completion date June 30, 1954.

April bookings of fabricated structural steel, according to reports compiled by the American Institute of Steel Construction, amounted to 205,022 tons, a decrease of 9 pct from the previous month. Total bookings for the first 4 months of the year totaled 875,358 tons, for a monthly average of 218,840.

Shipments during Apr. were 230,874 tons, down slightly from the four months average of 247,765 tons.

Backlog of work ahead as of Apr. 30 stands at 2,350,974 tons.

A tabulation showing the detailed figures for the four months is given below:

Estimated Total Tonnage for the entire industry			
CONTRACTS CLOSED	1952	1951	Avg. 1947-1950
Total Tonnage			
January	213,110	361,373	161,976
February	230,832	256,746	162,186
March	226,394*	297,517	221,387
April	205,022	337,026	177,825
Totals	875,358	1,252,662	713,374

SHIPMENTS			
January	244,947	214,000	166,910
February	246,398	193,638	161,179
March	268,840*	237,087	191,237
April	230,874	234,095	192,861
Totals	991,059	878,820	712,238

TONNAGE OF BACKLOG			
2,350,974	2,808,124	1,190,907	
Percentage scheduled for production within the next four months (To Aug. 31)			
46%	39%	55%	
Percentage scheduled for production after the next four months (From Sept. 1)			
54%	61%	45%	

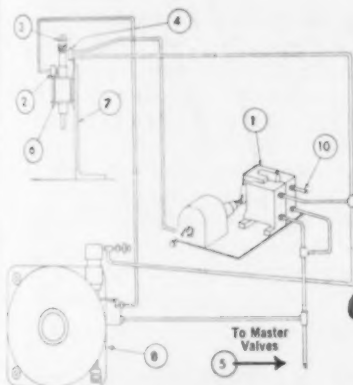
*Revised

PRESENTING THE AIR-OPERATED ROTARY WORK FEEDER *In Action!*

TIME and again Mead Work Feeders—using clean, inexpensive Air Power—have stepped up small piece production from 200 to 2,000 pieces per hour and more! Remember—it isn't the material in these "small piece" jobs that makes them expensive—it's the labor cost in feeding, holding or assembling them. Get the facts. See how you can save time, money, labor and increase profits with these ingenious air-operated MEAD Work Feeders. Write for Mead AIR Power Catalog.

A simple and inexpensive combination of Mead pneumatic devices makes a "One-Man Factory" to assemble brass couplings by flaring neck into nut, at the same time forming a fluid-tight seat.

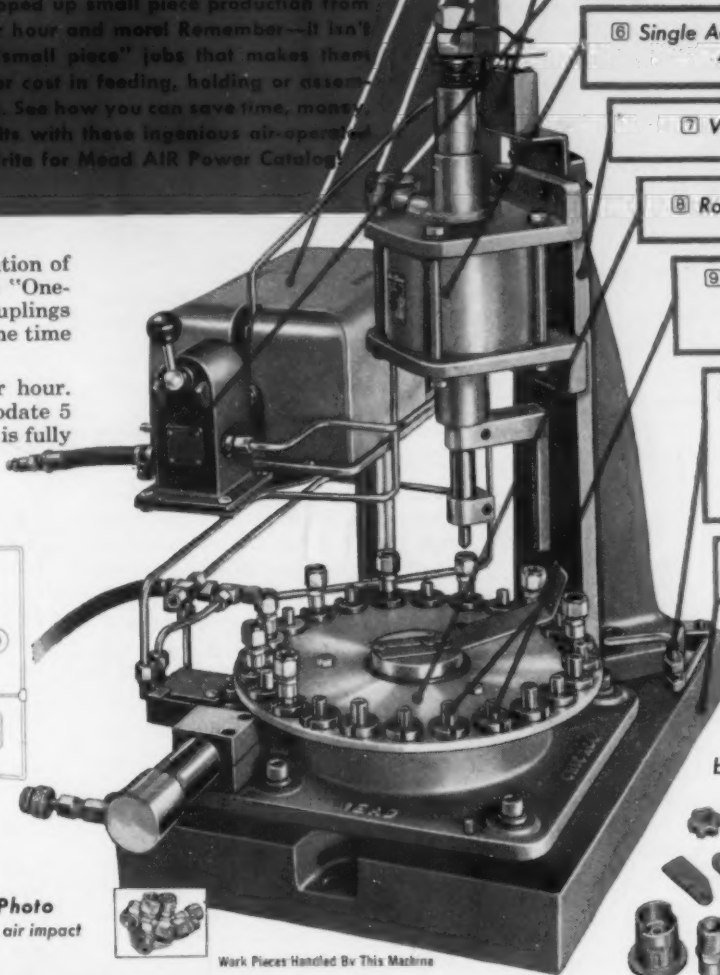
Output approximately 2500 per hour. Two sets of 12 mandrels accommodate 5 different styles and sizes. Operation is fully automatic except for loading.



Circuit Diagram of Units in This Photo
Combine readily to feed work to drill press, air impact hammer for a wide variety of operations.



Work Pieces Handled By This Machine



① Model 2 Meadmatic Timer

② #2 Quick Exhaust Valve to speed up return stroke

③ Adjustable depth stop with spring return

④ Cycle release valve (included with timer) to reverse cycle at end of down stroke

⑤ 4-B Master Valve starts and stops entire system

⑥ Single Acting Cylinder, 4" bore

⑦ Vertical Stand

⑧ Rotary Work Feeder

⑨ Alternate mandrels for two sizes of brass couplings

⑩ Air blast ejection of finished parts, by jet piped from second of two valves in timer

⑪ Universal Base

Typical Work Pieces Handled by Mead work feeders



MEAD SPECIALTIES COMPANY, Dept. BA-62, 4114 No. Knox Ave., Chicago 41, Ill.

WORK FEEDERS AIR VISES AIR CYLINDERS RIDGEY AIR CLAMPS

MEAD

AIR OPERATED DEVICES

IMPACT HAMMERS AIR PRESSES DRILL PRESS FEEDS WORK FEEDERS

Memo Coupon

MEAD SPECIALTIES CO.

4114 N. Knox Ave., DEPT. BA-62, Chicago 41, Illinois

Send free copy of new, colored MEAD INDUSTRIAL AIR POWER CATALOG describing the complete line of famous Mead air-operated devices.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____



Industrial Briefs

New Plant—GENERAL ELECTRIC CO., Schenectady, will build a transformer manufacturing plant at Rome, Ga. The new plant will provide employment for about 1700 people.

Ground Broken—Ground was recently broken for a new building at Waukegan, Ill., for VASCOLOY-RAMET CORP., a subsidiary of Fansteel Metallurgical Corp.

Hold Meeting—The triennial meeting of International Organization for Standardization will be held at Columbia University, June 9-21. American Standards Assn. will participate as a member in the 15 technical committee meetings scheduled. Attending will be delegates from standards bodies in 33 nations.

Permission Granted—CHICAGO DISTRICT PIPELINE CO. has been granted government permission to go ahead with the construction of 12½ miles of 30-in. natural gas transmission line.

Appointed Agents—WM. H. MULLER & CO., INC., New York, have been appointed exclusive sales agents for the Acoje Mining Co., Inc., Manila, Philippines, largest Philippine producer of metallurgical chrome ore.

Signs Contract—A contract has been signed with the Atomic Energy Commission by THE CARBORUNDUM METALS CO., INC., a subsidiary of The Carborundum Co., for the production of zirconium and hafnium metal.

Advanced Course—The sixth annual advanced course in Quality Control by Statistical Methods will be held at PURDUE UNIVERSITY, June 4-12. Prof. Irving W. Burr, of the department of mathematics and statistical laboratory, will direct the course.

Order Received—AMERICAN CAR & FOUNDRY CO. received an order from the Southern Railway for 1750 70-ton triple hopper cars.

Plant Expansion—J. HOLLAND & SONS, INC., Brooklyn, have started the expansion of plant facilities with a new 3-floor steel and reinforced concrete fireproof building.



COPY: Three engineers at Caterpillar Tractor Co., Peoria, Ill., examine a Stalinetz 80, track-type tractor engineered by the Russians from Caterpillar's D7. For a detailed comparison of the two tractors see p. 150, Technical Section.

Tour Started—A trio of Chicago industrialists consisting of Paul Ziegler, president, Midwest Coil & Transformer Co.; Tempel Smith, president, Tempel Mfg. Co., and James A. Boyajian, president, Triumph Mfg. & Engineering Corp., left recently on a 30-day INSPECTION TOUR of European manufacturing centers and trade shows to learn what engineers, physicists, and scientists abroad have developed in their respective fields since the end of World War II.

Dock Completed—IRVING SUBWAY GRATING CO. has completed a new \$68 thousand steel-piling dock at their Long Island City plant, abutting Newtown Creek.

Site Acquired—An 11-acre site has been acquired by CANADIAN SIEMPELKAMP LTD. at Hamilton, Ont., for the erection of a 1-story factory and warehouse.

Machine Tools—C. B. S. STEEL & FORGE CO., Los Angeles, has just installed more than \$1 million worth of machine tools, after getting a new multi-million dollar contract.

Company Acquired—OLIN INDUSTRIES, INC., East Alton, Ill., have acquired Ramset Fasteners, Inc., of Cleveland.

Electrical Work—ALLEGHENY INDUSTRIAL ELECTRICAL CO., Pittsburgh, is handling all the electrical work for three new manufacturing units of the Harbison-Walker Refractories Co., Pittsburgh.

Opens Warehouse—A new warehouse and branch office has been opened by CRUCIBLE STEEL CO. OF AMERICA, at 105 South Keystone, Indianapolis. An Open House will be held for customers and friends on June 13-14.

Representative — HEPPENSTALL CO., Pittsburgh, has appointed the Walter L. Potter Co., Johnstown, Pa., as their sales representative in Pennsylvania and Western Maryland.

Contract Awarded—A contract for the construction of the GENERAL MOTORS CO. plant at Arlington, Tex., has been awarded to Thomas S. Byrne, Inc., general contractors of Fort Worth.

Appointment—The Paul-Munroe Co., Bell, Calif., has been appointed the Los Angeles and Southern California representative for the RIVETT LATHE & GRINDER, INC., Boston.

Representative Appointed—Sales Engineering Co., Inc., Salt Lake City, has been appointed sales representative in the mountain states area for AMERICAN-FORT PITT SPRING DIV., H. K. Porter Co., Inc., Pittsburgh.

New Headquarters—PACIFIC INTERNATIONAL PRODUCTS, INC., have established new headquarters in the Boothe Bldg., at 475 Huntington Drive, San Marino, Calif.

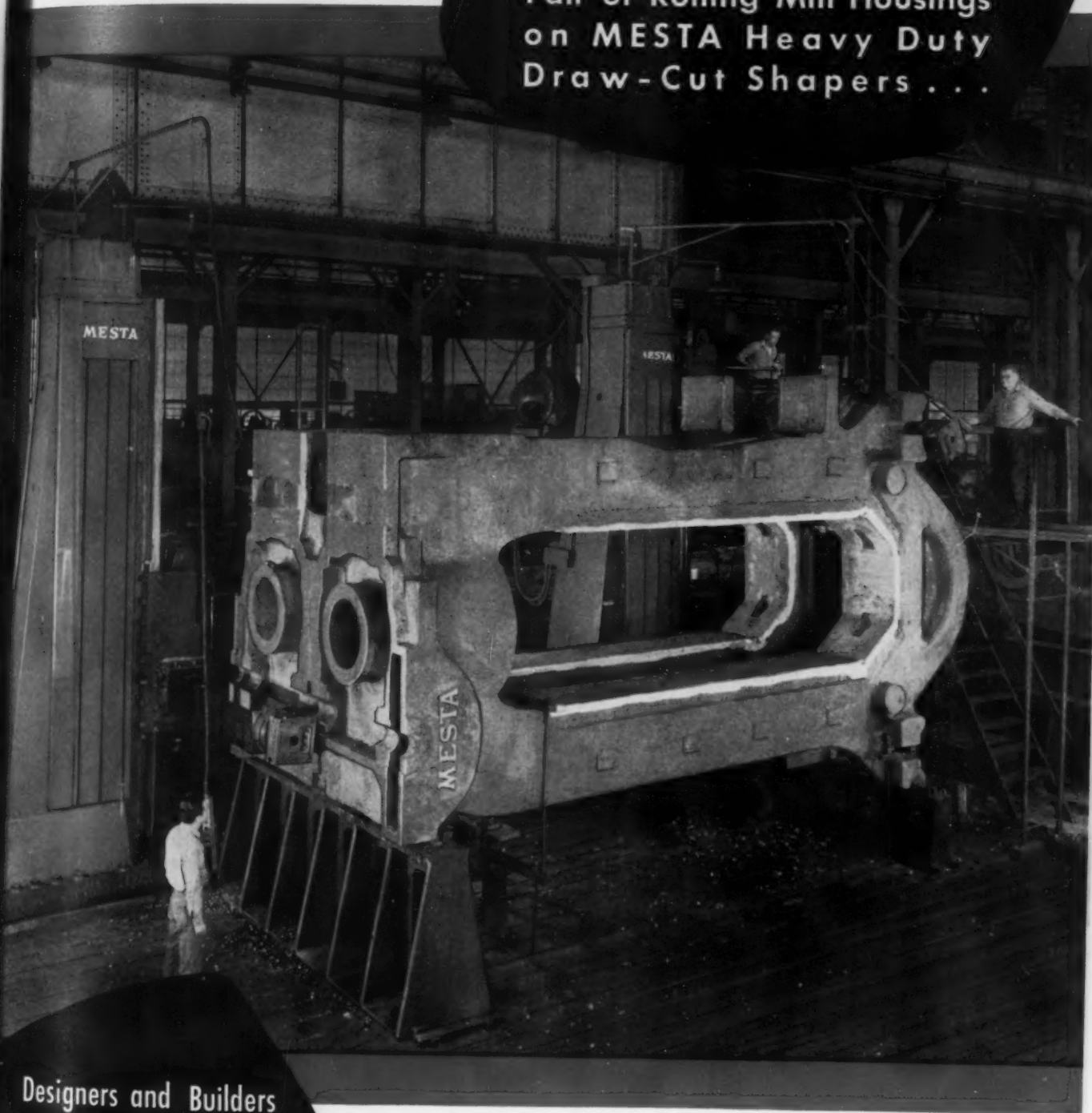
Open Plant—A new plant was opened recently in Hamilton, Ontario, by DOMINION FASTENERS, LTD., for the manufacture of Speed Nut fasteners in Canada. The Canadian firm will make the fasteners under a license from Tinnerman Products, Inc., Cleveland.

Finishing Consultant—Nathaniel Hall, well-known metal finishing consulting engineer, has formed his own firm, NATHANIEL HALL CO., with office and laboratory at 239 Waverly Ave., Brooklyn.

MACHINE SHOPS at **MESTA**

DRAW-CUT SHAPERS . . .

Simultaneously Machining a
Pair of Rolling Mill Housings
on MESTA Heavy Duty
Draw-Cut Shapers . . .



Designers and Builders
of Complete
Steel Plants

MESTA MACHINE COMPANY
Pittsburgh, Pa.

The Automotive Assembly Line

Carbuilders Train for Output Race

Planning for '53 models is well underway . . . Introduction dates vary . . . Dodge, Plymouth expected in early September . . . New Chevrolets seen as coming later—By R. D. Raddant.

Jockeying for position in the 1953 production race is well underway in the automobile industry.

Just as racing stables point for the Kentucky Derby more than a year ahead of time, auto companies make their plans far in the future. It takes about as long to

still excellent. Chevrolet personnel discourage talk of an early fall change over. Delivery dates on new Chevrolet equipment are later than Plymouth, indicating a later switch.

Both Chevrolet and Plymouth will have radical style changes to

Few new industrial plants are now constructed within the confines of a metropolitan area. Under the policy generally followed in the auto industry, new plants are built on the edge of heavily populated areas. There land is inexpensive and room for expansion is plentiful.

But it doesn't take long for workers to follow good paying jobs. Look what happened at the Chevrolet-Fisher Body plant at Van Nuys, Calif.

Construction of the plant to serve the expanding Southern California market was begun in 1945. Since then, in that immediate area, 6300 new homes have been built. Other businesses and industries are sure to follow.

Labor Trouble?—Pending revision of the cost of living index threatens the labor peace that has prevailed for almost 4 years in the automotive world.

Loophole words in the escalator clauses are that industrial contracts shall continue only as long as the index is maintained on the same base as that in use at the signing of the contracts.

Labor Dept.'s intention to bring the index up to date will provide an opportunity to break off contracts between automobile companies and United Automobile Workers. Contracts now have 3 years to run.

Idea is to substitute the 1947-1949 base period for the present 1935-1939 period. Labor Dept. officials feel that continuity will be uninterrupted.

UAW officials are not happy about the last Bureau of Labor Statistics revision. It resulted in a drop for the second quarter, right on the eve of a new increase in food prices.

Opportunity to break off the contracts is a test of whether real labor peace is desired. Best guess is that contracts will continue with only minor grumblings.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS	TOTAL
May 31, 1952	80,587*	23,135*	103,722*
May 24, 1952	99,065	28,658	127,723
June 2, 1951	91,707	29,769	121,476
May 26, 1951	122,990	35,269	158,259

*Estimated

Source: Ward's Reports

plan a new car as it does to breed and raise a thoroughbred for the racing classic.

When the 1953 race will get underway is a major point for speculation. Some entries are predicted to be ready as early as August or September. There is considerable pressure by sales people to revive the custom of early fall introduction of new models. With new models to show during winter months, some of the slack that hits auto sales with cold weather can be absorbed.

It is now pretty well established that Dodge and Plymouth 1953 models will be shown early in September. Delivery dates of parts and tools have pretty well indicated the early showing.

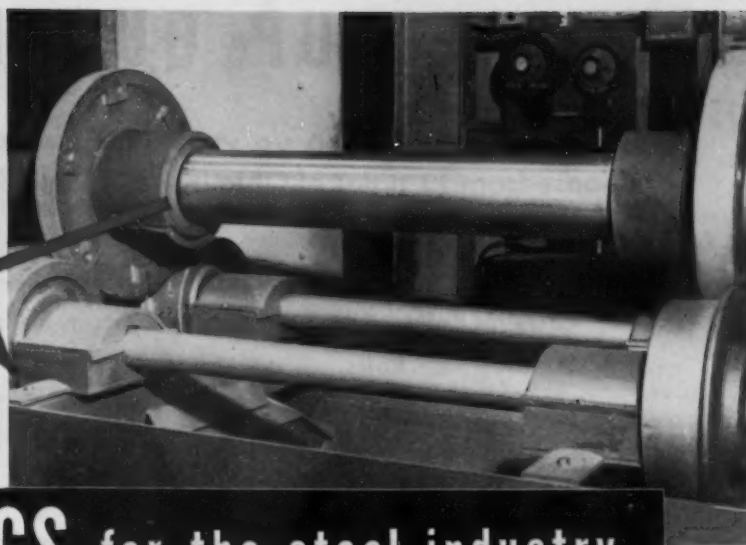
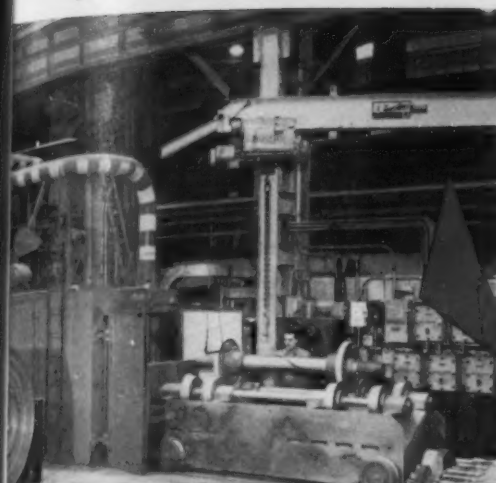
Coming Later—Chevrolet, the other low priced car that will show radical style changes, may not be out so early. There is considerable reluctance to stop production of the present model when demand is

keep pace with Ford. Ford will change its styling little, but will feature engine improvements.

Chevrolet, which has actually used its truck engine with its higher horsepower for the Power Glide models, is ready to drop its small 6-cylinder engine entirely. But at the same time, Chevrolet is looking to 1954 when a V-8 engine is expected.

Facilities Needed—Not only does the building of a V-8 involve engineering problems for Chevrolet, but production problems as well. Present engine plant facilities could not very well be converted for V-8 production.

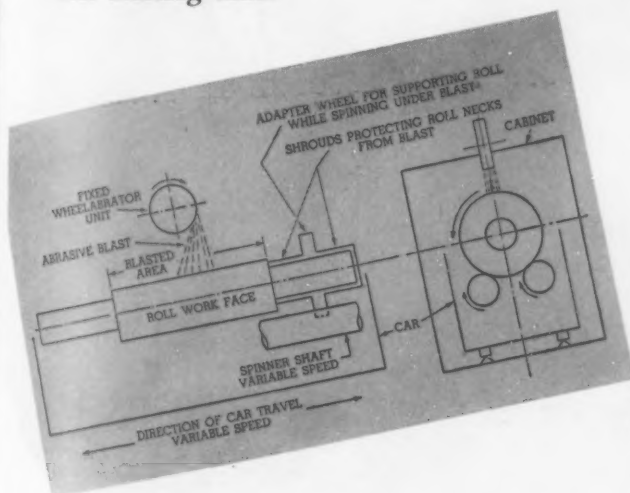
Chevrolet may look to its expanding Tonawanda, N. Y., plant to produce a V-8. The plant there is adding 1 million sq ft of floor space which will include an addition to the engine plant, a new foundry, and forging facilities. These would be tailor-made for production of a new engine.



NEW SAVINGS for the steel industry

Etching mill rolls with the Airless WHEELABRATOR®

The Wheelabrator opens new horizons in cost-savings possibilities for steel mills in the etching of mill rolls used in temper mills. In a typical installation at the Weirton Steel Company, 8 to 9 inch diameter rolls are etched in just 54 seconds blasting time. Large 26 and 27 inch diameter rolls used in the cold mill, are etched in 3 minutes blasting time.



The diagram shows the airless Wheelabrator method of roll etching. This exclusive development conveys and rotates the work under a fixed and constant rectangular blast from the wheel.

American
WHEELABRATOR & EQUIPMENT CORP.

510 S. Byrkit St., Mishawaka, Ind.

Wheelabrator®
AIRLESS BLAST
CLEANING

PAYS FOR ITSELF THROUGH SAVINGS

Weirton previously roughened its temper mill rolls by passing emery paper between the rolls after installation in the mill. By eliminating use of emery paper for the initial etching of ground rolls, the Wheelabrator will more than pay for itself through savings in the cost of paper alone. Another big advantage is that it provides a better shape to the roll which means better gripping in the mill. Wheelabrating also provides an etch of a more uniform depth and texture which insures an improved surface on the steel sheet.

AN IMPROVEMENT OVER AIRBLASTING

The Wheelabrator roughens mill rolls in 1 to 3 minutes that commonly takes from 10 to 30 minutes in conventional airblast machines. It produces a uniform etch automatically at a greatly reduced cost per roll. It is a proved fact that rolls so etched have a materially increased life in the mill with a resulting increase in tons rolled per set of rolls.

Write today for complete information.

D-3375 **WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT**

June 5, 1952

STEPPED-UP QUALITY

Use Ohio Rolls to step up your mill production.
Choose from 11 types of Ohio Iron and Steel Rolls:

Carbon Steel Rolls

Ohioloy Rolls

Ohioloy "K" Rolls

Holl-O-Cast Rolls

Chilled Iron Rolls

Denso Iron Rolls

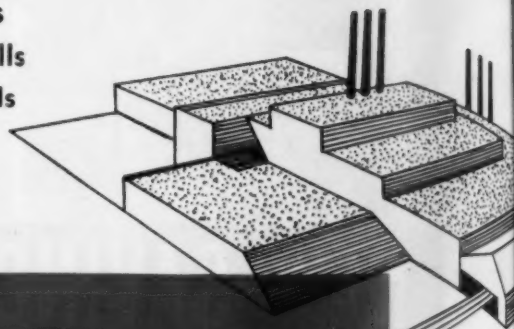
Nickel Grain Rolls

Special Iron Rolls

Nioloy Rolls

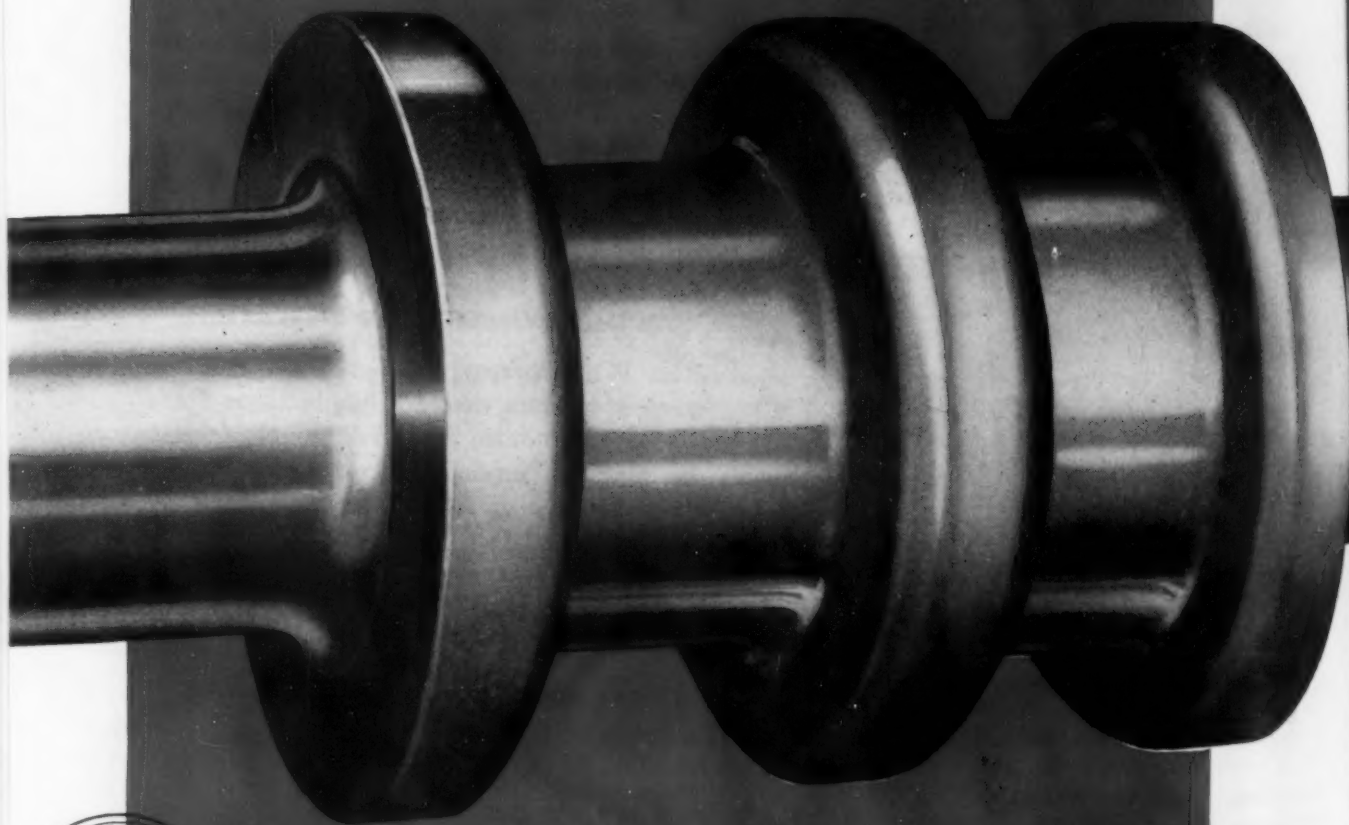
Flintuff Rolls

Ohio Double - Pour Rolls



Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY



THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO • PLANTS AT LIMA AND SPRINGFIELD, OHIO

ATOMS: Used by Ford for Testing

Radioactive materials used in design, quality control . . . Bombarded in atomic pile at Oak Ridge by AEC . . . Checking welding is one use . . . Not dangerous if handled properly.

Probably the most effective sign in all Ford Motor Co. buildings is a simple one stating "Radioactive Material—Keep Out."

Not only do visitors keep out, but they stay away. Mysteries of atomic energy and stories of the effects of radioactivity work better than a cordon of armed guards in keeping unauthorized persons out of Ford's radioactive isotope laboratory.

But behind this sign, with all its dangerous implications, Ford research engineers are busy in day to day use of peaceful adaptations of atomic energy.

Arthur Smith, 31-year old Oak Ridge-trained research engineer, is in charge of the laboratory. Every day he handles Ford's radioactive cobalt, iron, tungsten, polonium and radium D.

All these are used in engineering measurements for designing and testing Ford products. They are purchased from the Atomic Energy Commission after being subjected to a month's atomic bombardment at Oak Ridge, Tenn.

Checking Welding—Radioactive materials are used, for example, in checking the quality of a weld in a heavy part. Photographic film is placed on one side of the weld and a capsule of radioactive material on the other side. Penetrating rays will record any flaws. Radioactive tungsten is used to test engine gasket performance.

Working with radioactive material isn't considered dangerous, if required precautions are taken. Rubber gloves, long screw drivers, glass hoods, and steel brick shields are protective devices. Besides, Geiger counters and other alerting devices are placed around the laboratory. Each laboratory employee carries a pen-like electron counter in his pocket.

Actually, material used in the laboratory isn't dangerous. Radioactive cobalt, the hottest material in the laboratory, isn't much more dangerous than the doctor's Xray, Mr. Smith says.

GM Building Dual-Purpose Plant

Dual-purpose plants have been advocated by Charles E. Wilson, president of General Motors, as the answer to "butter and guns" production problems.

First real test of this theory will come at Arlington, Tex. There General Motors is constructing its first dual-purpose defense plant built by GM with GM funds.

Elsewhere in industry, defense and civilian production are under way under one roof on parallel production lines. The Arlington

plant, however, is the first to be constructed with this in mind.

John F. Gordon, GM vice-president, explains that the plant's plans call for fabrication and assembly of a Grumman Navy airplane using up 400,000 sq ft of factory space. The remaining factory area of more than 800,000 sq ft will be adapted to manufacture and assemble Buick, Oldsmobile and Pontiac cars. Production is still more than a year away.

Gordon estimates that in case of necessity aircraft production can be multiplied several times by redistribution of floor space. The time required for the change may coincide with delivery of materials.

Farley Goes Into Truck Business

James A. Farley, former Postmaster General, added the automobile business to his wide financial interests. GMC Coach and Truck Div. announced that Mr. Farley is president of a newly organized Farley-GMC Truck Co., located at 603 West 23rd St., N. Y.

THE BULL OF THE WOODS

By J. R. Williams





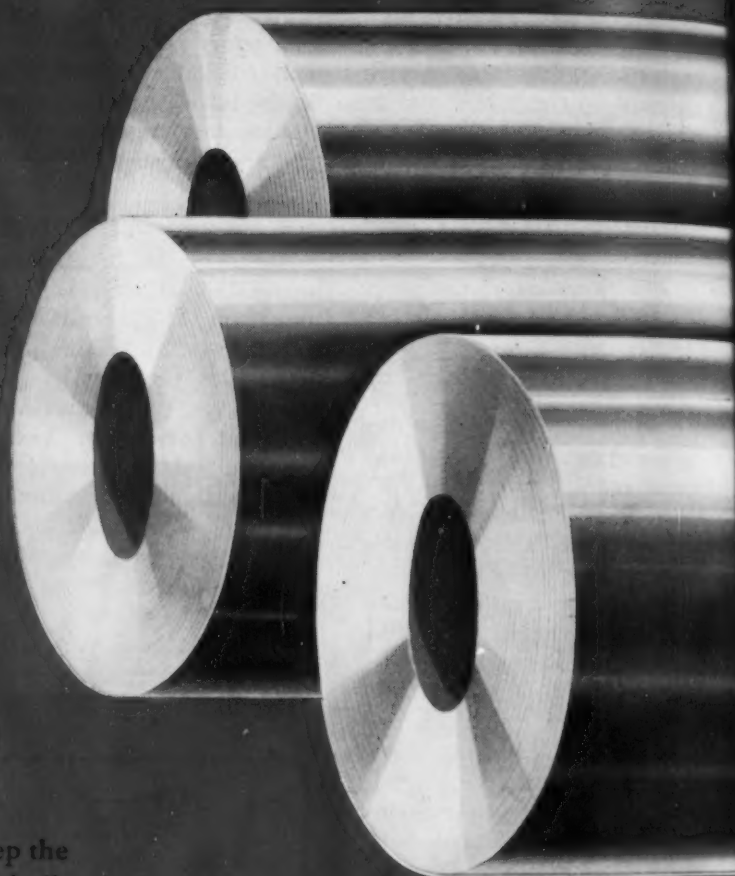
by the hour...

and by the ton

Heppenstall
back-up roll Sleeves
make good production sense

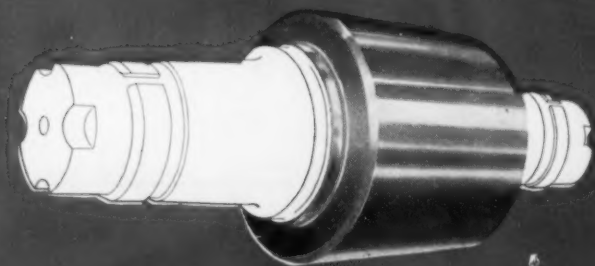
Heppenstall Sleeves for Back-Up Rolls keep the mill line running longer because they're built to last. They mean less down-time—increased productivity—lower overall costs. Their records of performance make good production sense. They show increases in productivity of from 61% to 128% in terms of roll service, which are typical of the benefits in time and cost savings—increases in production.

And, there's plenty of "reason why" Heppenstall Sleeves provide this exceptional service. Each sleeve is forged from Heppenstall's own alloy



steel and "custom-built" . . . normalized, annealed, heat treated, and tempered to exact specifications. The results: correct hardness . . . maximum density . . . perfect fit . . . durable surfaces . . . resistance to cracking and spalling in high speed service.

For complete information and technical assistance, call Heppenstall Company, Pittsburgh 1, Pa. Sales offices in principal cities.



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Oil Men Hunt Holes in Ground

New studies show underground storage of petroleum products feasible . . . Saves steel, money, manpower . . . Salt deposit cavities, mine openings rated most suitable—By G. H. Baker.

Orders for steel plate to be used in construction of oil storage tanks are due for sharp re-appraisal by the nation's oil producers and refiners.

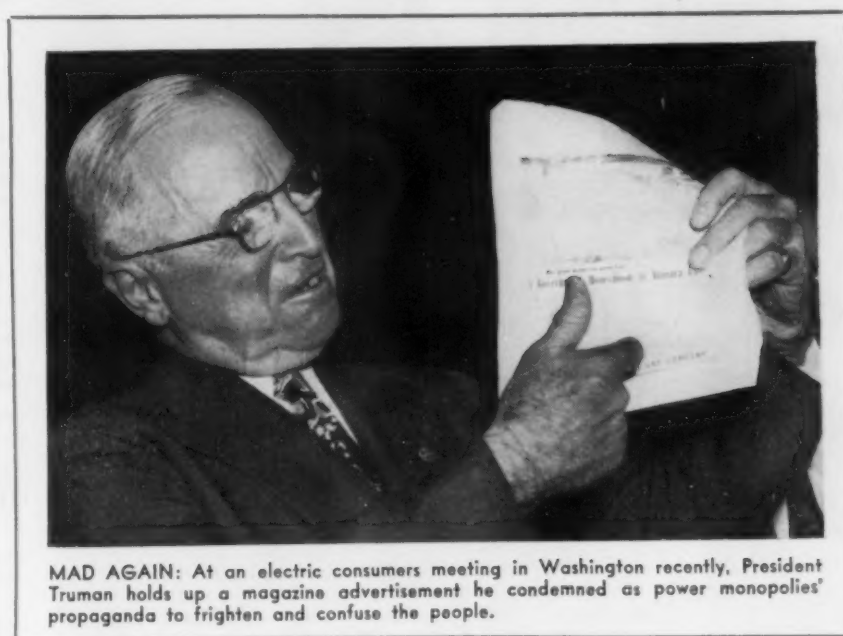
Recently-completed surveys conducted by the oil industry of underground stockpiling possibilities show that both crude and refined petroleum products now may be safely stored underground with little danger of loss and at considerably lower cost. (For underground gas storage, see *THE IRON AGE*, Nov. 1, 1951, p. 76.)

In many instances, it is agreed by government and industry engineers, substitution of underground storage for conventional steel storage tanks is going to be dictated by the economics involved. For example, Interior Dept. engineers are now studying these comparable cost figures submitted by the National Petroleum Council:

Type of Storage	Cost	Steel Needs (lbs)	Labor Need (man hrs.)
(All on Per-Barrel Basis)			
Pressure Surface Tanks	\$20.00	98.0	1.26
Atmospheric Surface Tanks	\$ 1.09	7.5	0.07
Salt Cavities	\$ 0.75	1.5	0.11
Mine Cavities	\$ 4.05	2.2	0.37

Hunt Holes — The savings in steel plate and pipe, together with savings in man-hours, are causing both producers and refiners to scout the countryside for suitable mine openings. In addition to the savings in steel and labor costs, the industry is impressed with engineering data which show that properly-constructed underground storage at acceptable sites could meet any foreseeable need for stockpiling crude oil or finished products. Such underground reservoirs could also satisfy part of the oil industry's storage needs.

Underground storage sites are now rated by engineers in this order of suitability: (1) Cavities dissolved from salt deposits where they have adequate thickness and purity; (2) existing mines where problems of sealing are not too



MAD AGAIN: At an electric consumers meeting in Washington recently, President Truman holds up a magazine advertisement he condemned as power monopolies' propaganda to frighten and confuse the people.

great and where there is expectation of long-term roof stability; (3) cavities created by mining shale where shale deposits have necessary strength and freedom from cracks and contaminants; (4) cavities created by mining hard rock; (5) traps in naturally permeable rocks, such as structural domes and sedimentary lenses; (6) natural caverns, and (7) abandoned coal mines.

These last three possibilities are held to be of doubtful value. Except in certain instances, they are too easily susceptible to seepage, rock fissures, sealing problems, and other drawbacks.

Next move is up to the Interior

Dept., which soon will ask state geologists to suggest available and suitable underground sites.

Dilemma Solved—Military procurement officials, who often complain of the appalling problems confronting them in trying to comply with the maze of government buying regulations, have one less dilemma to face this week.

Given a choice between awarding a defense contract to a small firm located in a non-labor-surplus area and a larger firm located in

an unemployment distress area, Office of Defense Mobilization has ruled, the job must go to the small business concern.

Up to now, the lack of any clear-cut policy with respect to this problem has caused endless confusion among Pentagon procurement officials and about as many decisions have been made favoring larger firms in distress areas as smaller firms in non-distress areas.

Sad Lot—Secretary of Defense Robert A. Lovett has on several occasions called attention to the sad lot of procurement officers. Among other things, they must prevent discrimination in hiring on mili-

Challenging the Industry!

THE A.O. SMITH **CHALLENGER** SERIES A.C. WELDERS

THE BEST BUY IN A.C. WELDERS!

The A.O. Smith "CHALLENGER" Series of production welders are the outstanding values in the A.C. welder field. Why? Because they offer *more* welding production per dollar invested than any competitive welder in their price range!

"Challenger" welders because of their wide amperage range are adaptable to more welding jobs than competitive machines that are priced higher. The 400-amp. model for example burns $\frac{3}{8}$ " diameter to $\frac{1}{16}$ " diameter electrodes.

75 open circuit voltage eliminates the need for starters or other gadgets. This enables you to get smoother, higher quality welds with a minimum of maintenance. Yes, Low-Hydrogen electrodes can be welded easily with *this* machine.

Proved in continuous, three-shift operation on the world's toughest production welding assignments . . . equal to years of normal shop use . . . the "Challenger" assures you of *absolute dependability*.

You get improved welding quality with safe, quiet operation. Welding connections are sure and convenient. Ample copper in precision-wound coils assures peak efficiency always. And rugged construction for long life means uninterrupted welding production.

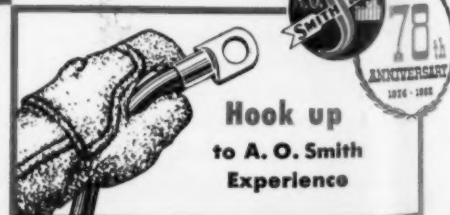
Get all the facts on "Challenger" construction, performance and price. Write for literature. Address:

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Welding Products Division, Dept. IA-652
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The A. O. Smith "CHALLENGER" Production A.C. Welder.
Available in 200-, 300- and 400-amp. models. N.E.M.A. rated.

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A.O. Smith
WELDING PRODUCTS



tary contracts, must pay due regard to the government's policy of geographic dispersal, must avoid concentration of contracts with big companies, must keep small business alive, and must help unemployment areas.

By this time, as Mr. Lovett puts it, the officer is looking into military regulations to see if an officer of his age and experience can retire honorably.

Tariff Fears—Foreign trade officials, alarmed at the mounting pile of applications for tariff protection against the growing volume of imported manufactured goods, are about to embark upon an "educational" program for U. S. firms.

New line of thought will be pitched to the theme that tariff-tinkerers are jeopardizing both foreign and domestic security in their insistence upon protection against low-cost imports.

Restrictions now being sought by U. S. producers and manufacturers would not only restrict the ability of Western Europe to carry its weight in the rearmament program, it is said, but also would postpone the time when American taxpayers should be free from the burden of foreign relief.

Atomic Weapon Program Studied

Congress this week was considering the new White House request for a \$4.2 billion atomic weapon program. President Truman is asking that \$3.3 billion worth of new projects be approved immediately so the U. S. may "maintain and increase" its leadership in new weapons.

Program is to be spread over a 5-year period and is to include new facilities for production of fissionable materials and for fabrication into atomic weapons.

An immediate start on the huge new program is the only alternative available, Mr. Truman stated, since Russia refuses to consider any international ban against atomic weapons or plant and equipment necessary to produce them.

Loans:

RFC, SDPA approve \$1,676,750 in funds for small metalworkers

A total of \$1,676,750 in government loans for small metal-working firms holding defense contracts has been approved by the Reconstruction Finance Corp. and

Milk Shocks Stabilizer

Milk prices were a big shock to Price Stabilizer Arnall last week.

He told the House Banking Committee that his wife had sent him to the store for a quart of milk. Mr. Arnall gave the grocer a dime, and was astonished to find the price about 28¢.

He explained that he is pretty far "behind the times" because he doesn't do much shopping. Housewives in the audience just laughed and laughed—and went on paying 28¢ for a quart of milk.

the Small Defense Plants Administration.

Recipients of the loans, amounts, and purposes as stated by RFC follow:

McGrath & Co., Stillwater, Minn., \$150,000, for working capital to produce ordnance equipment.

Simonds Aerocessories, Inc., Tarrytown, N. Y., \$280,000, for expansion of facilities for production of mechanical measuring instruments and aircraft accessories.

Ahrendt Instrument Co., College Park, Md., \$200,000, to expand facilities for production of mechanical electrical products needed in the defense program.

Joseph M. French and Louis Sherman, doing business as East Texas Scrap Salvage Co., Tyler, Tex., \$19,250, to expand existing facilities and purchase machinery for salvaging scrap metal and paper.

Brunswick Marine Construction Corp., Brunswick,

Ga., \$120,000, marine work, industrial repair, fabrication of metal products, production of precast concrete channel slabs, roof slabs, and acoustical slabs.

American Machinery Corp., Orlando, Fla., \$500,000, to purchase machinery for manufacture of shell cases for Army Ordnance and Army Chemical Corps.

Parkersburg Die & Tool Co., Parkersburg, W. Va., \$50,000, to fabricate steel for Atomic Energy Commission's Savannah River plant.

Lee Ray, Como, Tex., \$22,500, oil field construction, oil field machinery.

Philip Scheiber, Robert L. Novack, Frank T. Malley, II, doing business as Associated Iron & Metal Co., Oakland, Calif., \$335,000, for plant expansion related to collection of scrap metal and secondary smelting.

Growth Opportunities Program Set

Industrial expansion opportunities will be shared by both small and large companies under terms of a program newly worked out by Defense Production Administration and Small Defense Plants Administration.

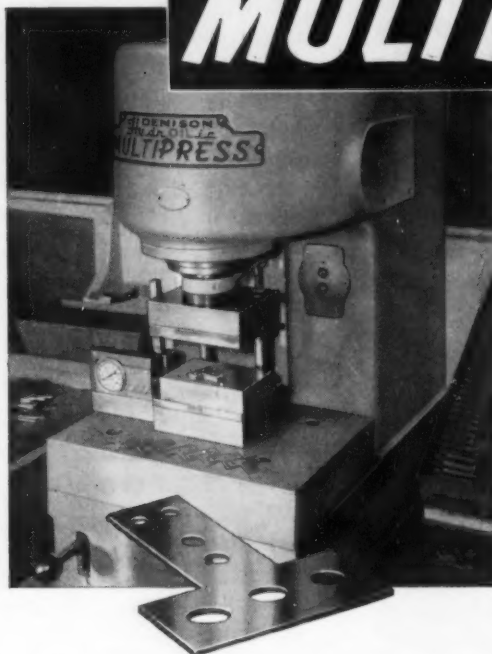
Small business thus will have the opportunity to maintain the position it held in industry prior to outbreak of Korean fighting, the agencies predict. This program is based on a previous agreement allowing SDPA to recommend a part of various expansion goals to be filled by small firms alone.

Freighter Conversion Proposed

Ten wartime freighters would be converted at government expense to accommodate ore and other bulk shipments, under the provisions of legislation now being considered in the House of Representatives. Conversion of the ocean-going ships, all of the C-4 type, is backed in the House by Rep. Edward A. Garmatz, D., Md.

No wonder they keep coming to

MULTIPRESS®



Accurately gauging laminations for solenoids used in timing devices and other electrically controlled equipment is one of several unusual Multipress jobs at the National Acme Co., Cleveland, Ohio.

An adjustable gauge bar is attached to a solid steel block which is mounted on the ram of a 4-ton Multipress. As the gauge bar descends with the ram and contacts a stylus connected to an indicator dial, the accuracy of thickness of each stack of laminations is instantly and automatically shown—in ten thousandths of an inch.

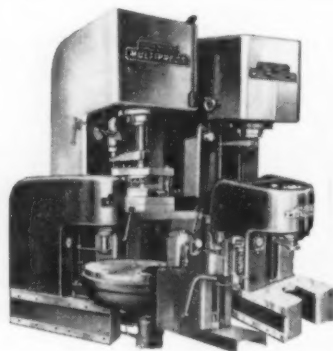
Multipress is five times faster than the previous method of compressing the parts in a vise and gauging them with a hand micrometer. Rejects have been cut sharply, as all parts are evenly compressed, and checked under exactly uniform pressures.



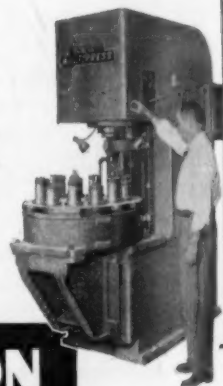
For a difficult broaching operation on a part that had to be "handled with care," Fee and Stemwedel, of Chicago, turned to Multipress—and results were more than satisfactory.

With a single ram stroke, the 6-ton Multipress above puts 120 close-tolerance serrations around the rim of a thin-walled compass bezel made of half-hard brass. The notches are .018" deep; allowed tolerance is only .003" plus or minus. At a production rate of 800 units per hour, scrap losses average less than two per hour and these are due entirely to incorrect placement by the operators!

Multipress does the work with automatic accuracy. Women operators with no special training get perfect results—and they like the smooth, easy, quiet, safe action of Multipress.



Smooth, rapid power control and accurate, widely adjustable action make Multipress the quick, cost-cutting answer to better results on hundreds of production jobs. In addition, Multipress is specially designed for easy tooling of the widest variety. Built in eight basic frame sizes, with capacities ranging from one ton to 50 tons, it offers a choice of manual and automatic controls, valving for many special types of ram action, and automatic single or sequence cycling. Hydraulically interlocked Index Table Feeds, Automatic Stock Feed and many other Multipress accessories available. Write today for full details.



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West Coast Report

European Tool Shipments Continue

Long domestic delivery dates raise popularity of foreign machine tools . . . Percentage of total small . . . Cheap water freight rates another strong talking point—By T. M. Rohan.

Foreign machine tools, cashing in on long delivery dates for U. S. tools, continue to be delivered to the western market. One importer reported 300 pct increase of deliveries in the last 6 months.

Although not representing more than 5 to 10 pct of total western business, their 1- to 3-month delivery dates have been a strong talking point.

Traditionally 10 to 25 pct cheaper than U. S. tools, the European units have an additional advantage in the West due to cheap water transportation. Water freight rates from Europe to San Francisco are about the same as from eastern U. S. by rail. Extra freight on a 4-ton machine by water from New York to the West is only about \$30.

Where 30-day delivery is adequate, even U. S. manufacturers as far inland as Cleveland are now shipping by rail to New York and then by water to the West at a freight saving of 15 to 20 pct. Recent rail freight boost has given this added impetus.

"Rob" Orders—European machine tool makers, notably the British, are so eager for U. S. dollars they will rob a domestic order to sell to America.

Many western firms which placed foreign orders a year ago are now taking shipment in increasing quantities. Over 200 French milling machines, for instance, were ordered from one firm and are now starting to come through.

Several firms have gone into foreign tools (at the expense of their U. S. franchises) and found sudden prosperity.

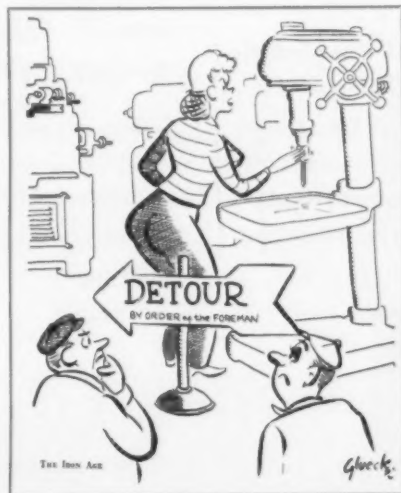
Postwar quality and precision

of imported tools has been improved. Repair and service facilities are noticeably absent because the market does not warrant them, but dealers claim shipment from eastern stocks will match those of U. S. firms. Bearings, usually first to go, can be procured locally to fit.

Principal countries now shipping to the West are England, Germany, France, Sweden, Italy and Belgium. A few sales of Japanese tools have been reported but most dealers shy away from them. The Japanese are in business, however, and represent a potential source.

Furnace Out—Western steel production will lose an estimated 25,000 tons of pig iron as a result of a breakout around the tap hole of the No. 2 furnace at U. S. Steel's Geneva, Utah, plant last week. The unit was expected to be out 3 weeks while bricks are replaced around the bottom.

The strike loss made this seem insignificant.



Defends Action—Wage Stabilization Board Chairman Nathan Feinsinger on a whirlwind trip to San Francisco last week again defended WSB action in the steel wage case and said he hoped the tri-partite setup would be continued. Some observers derided WSB's effectiveness, pointing to its failure to prevent a strike.

Mr. Feinsinger bemoaned the "adverse publicity" in the steel case "most of which is based on a misunderstanding of the board's recommendation and overlooks the fact that it covered a period of 18 months instead of the usual 12 months in prior steel wage contracts."

"Academic"—He said that an all-public board such as urged by the U. S. Senate Banking Committee would probably make rulings "which may be more academic and theoretical than realistic."

He added that all proposals he has seen so far on alternative methods of settling wage disputes "would result in more, rather than less governmental interference in collective bargaining" and would tend more toward compulsory arbitration, injunctions and seizures.

He also added a note of irony that "the night before the President ordered the seizure, I think we were on the verge of a wage settlement."

Grown Soft?—American businessmen used to virtual government guarantees of business during and since the war have lost sight of the meaning of competition. Leo M. Cherne, executive director of the Research Institute of America, last week chided the National Sales Executives convention in San Francisco for being "terrorized by signs of some price declines and returning competition." He added no depression is likely because "we'll be engaged for years in a most gigantic pump priming."

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DUCTALLOY is especially valuable for intricately shaped pressure castings with many machined surfaces such as this fire control housing casting.

DUCTALLOY, the new cast iron that bends without breaking, possesses many new, outstanding advantages, one of which is remarkable machinability.

In the annealed condition it has a guaranteed minimum tensile strength of 60,000 psi, yet it can be machined at a cutting speed of 980 fpm, more than double the rate for grade B cast steel and 2 to 3 times that of class 40 gray iron under identical conditions. The machined surface compares favorably with that of steel.

DUCTALLOY can be cast in intricate shapes with close tolerances and less machining stock than cast steel—it is particularly valuable for pressure castings which remain tight at hydrostatic pressures higher than the shattering point for any gray or alloyed cast iron.

There are many applications in which DUCTALLOY will render better service and contribute to lower costs in the finished product through savings in labor and machining time. Write for information.

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Gold Prices Have Lost Their Glitter

New gold mining at standstill . . . Price support of too-low gold price offsets shutdowns, but base metals boom . . . Mills booked on heavy lines, not on light stuff—By F. Sanderson.

Gold, the No. 1 glamour metal, has lost much of its glitter as far as prospectors and mining companies in Canada are concerned. Fading interest is not due to a slackening in demand for the yellow metal. It can be credited entirely to the low price. The official world price is \$35 per fine ounce, but the Canadian price is around \$34.50 just because the dollar is at a premium over the U. S. dollar.

Also the free market price of gold has been falling. Those companies selling this way are getting around \$37 or \$38 per ounce. Gold is the one metal that has reached price stagnation while other metals have skyrocketed.

Price Rise?—Canada's gold producers hope the official price will be boosted soon. They are hanging on for this reason. Yet nothing concrete to bolster this wish has been forthcoming. It may be that these fond hopes are wishful thinking.

Until last year the Canadian dollar was pegged at a discount of 10 pct below its U. S. counterpart. Gold producers then received \$38.50 per ounce. Since the freeing of the dollar, gold mining companies have taken a licking of around \$4 per ounce on gold sales. Meanwhile, production costs have soared. To enable mines to hold out, Canada has been bonusing production.

With our mines on relief in this way the marginal producers have been able to stay in business and even show small profits. But no effort is being made to bring in new producers.

Needed Support—About one-third of Canada's gold mines have been producing gold at costs run-

ning well above the actual market price. Some 25 gold mines have production costs ranging from \$35 to \$49.95 per ounce.

If the government suspended its financial support ruin could easily result. There are dozens of gold prospects in the country that have been explored sufficiently to deter-



NEW MILL: J. K. Corley, president, Acme Steel Co. of Canada, Ltd., breaks ground for the new Scarborough Works near Toronto. Watching, left to right, are Ben H. Gelgoot and William T. Hanley of Acme; Arthur Torrens, Sam L. Felton, and John E. Ott of Acme Steel Co. of Chicago; Edward C. Evans, Acme Steel Products Div.; and A. F. Burnett, Anglin-Norcross, Toronto contractors.

mine production possibilities but now nothing can be done to activate these deposits.

Base Metals Boom—While gold bides its time, there has been a tremendous revitalizing of the search for other metals. This effort is paying off in a big way. New base metal mines are springing up in many districts.

The search for iron is extending and within 2 or 3 years additional millions of tons of iron ore will be pouring out of our mines. Oil and industrial metals and minerals today are the focus of attention. Had the precious metals continued in their position as big profit-

makers the base metals might not have been so fortunate.

Steel Market—In the steel markets conditions have changed little in the past week or two. Mills are fully booked on heavy lines to the end of September and there are no indications of increased tonnage under allocations over the next 4 months. On some of the lighter lines mills have unfilled capacity.

Small Business—Defense contracts are being awarded on a larger scale. Small industries are being asked to participate.

Ferranti Electric Ltd., Toronto, has an order for \$3,900,000 worth of aircraft artificial horizon instruments from the Defense Production Dept.

Anglin Norcross Quebec Ltd. has been awarded a \$1,100,000 contract for extension of the Canadian Arsenals Ltd. plant at St. Paul L'Ermite, Que.

Acme Steel Co. of Canada, subsidiary of Acme Steel Co., Chicago, has started preliminary work on construction of a \$1 million plant at Scarborough, on the outskirts of Toronto. The plant to be completed in the fall will manufacture flat steel strappings and seals for container reinforcement.

Machine Tool High Spots

Is a New Order Slump on the Way?

Some toolbuilders fear defense-order hump is passed . . . New order index down, shipments up . . . War effort slowdown cuts '52 estimates . . . Still plenty of business—By G. Elwers.

A lot of people in the machine tool industry fear they are over the defense-business hump and sliding fast down hill toward a slump like that which followed World War II. Last month the new order index dropped below 300 for the first time since November, 1950. Shipments rose again, as they have every month since Korea. The industry backlog stands now at 15 months, lower than it has been since the end of 1950.

A few months ago many builders of machine tools were staggered with heavy cancellations, mostly from Air Force contractors. Since then cancellations have dropped to near normal. But, the industry wonders, should cancellations be up even to normal levels if high demand for machine tools still exists?

Cut Estimates—Another item to cause worry has been the 33 pct reduction in government estimates of machine tool needs for 1952. At the beginning of the year the estimate was \$1.5 billion. Then it was dropped to \$1 billion. And it has been said that even the \$1 billion figure does not represent net orders. It is said to mean only gross orders, from which cancellations must be deducted.

National Production Authority recently tried to soothe the industry by pointing out that although the rate of buying machine tools was being slowed due to phasing-out the defense program, there was no contemplated reduction in the total number of machine tools to be bought.

Plenty of Business—All available evidence indicates this is so. There is still plenty of business

ahead for machine tool builders. There is no predicting what turn the international situation might take, nor what a new Congress might do to the defense budget. Nevertheless, defense business in sight now seems plenty to keep the industry busy until 1955. That's only the business in prospect today.

For one thing, tools on order for many defense plants cover only those needed for pilot lines. Many more will be needed to attain full production. As an example, a Buick aircraft engine plant's pilot line uses 1198 machine tools. For full production in this plant, a total of 5528 machine tools will be required.

Looking Ahead—And there are entirely new defense tooling programs ahead. H. R. Boyer recently gave some hint of these in testifying before a Senate committee. He said:

"Ahead lie vast machine tool purchases to accomplish the

broadened base insurance policy. Ahead also lies the production of superjet engines. These will not only have more stages and bigger compressor wheels, but they will be made of forged steel which requires four times the machine capacity for aluminum (of which current compressor wheels are made)."

Ahead, too, are guided missile programs.

Surplus—As a result of buying for defense plants, the government is becoming the owner of many thousands of machine tools. Everybody seems agreed that it should not dump them on the used market when they are no longer needed in defense plants. That practice almost ruined the tool industry after the last war. Disastrous effects of indiscriminate machine tool dumping are not desired in this continuing crisis, machine tool people say. There's no clean-cut end to the emergency.

But though everybody talks about this, nothing has been done. There is no assurance that some future Congress won't suddenly discover the government owns, and pays millions to store, machine tools it doesn't need, and order immediate disposal of them. It is clear right now that this shouldn't be done, but will it be clear a few years from now?

The industry is worried, and keeps pressing for a safe disposal law now, while Congress is still well-briefed on machine tools. It is hoped this will be an early recommendation of the new Advisory Committee on Production Equipment.

Manpower—A recent survey shows that two-thirds of machine tool builders are still having manpower trouble. Second and third shifts still aren't filled in many plants. However, the situation has eased since last November, and is improving rapidly.



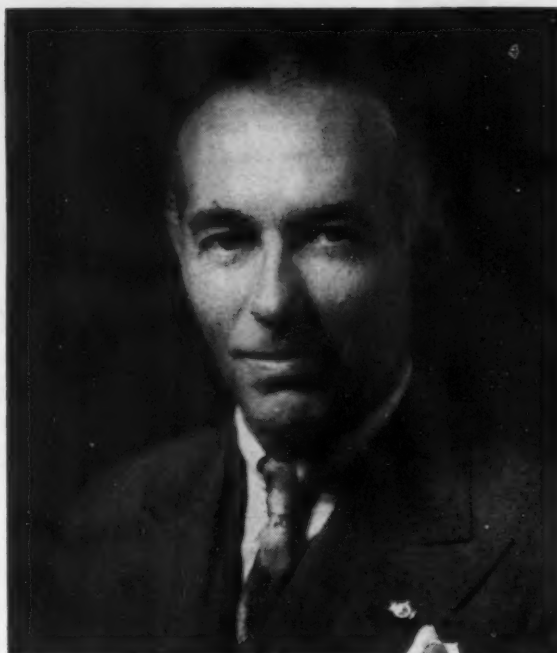
"E-b-l, indeed!"

The Iron Age

SALUTES

Arthur P. Davis

A leader in instrument design, he has been called out of retirement to head the firm he helped found.



EARLY Christmas morning, 1902, a sleepy-eyed, pajama-clad youngster crept stealthily into the living room to examine the gaily wrapped packages under the tree. Along with a sled, skates and games, he found two volumes entitled, *The Romance of Modern Electricity*.

Life's turning points are rarely reached by age seven. But for Arthur P. Davis these books became a second Bible, to be read and reread. Their contents were memorized and most of the experiments attempted, one in particular being an electrical solution of the backyard cat problem.

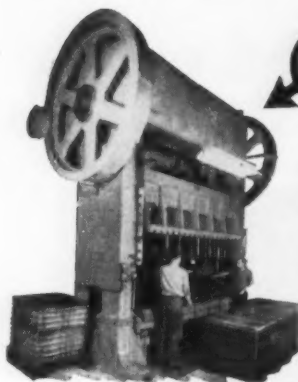
Art's preoccupation with electricity resulted in his being kicked out of high school before the end of his freshman year. But, it also pointed the way to his joint founding of the Arma Corp., now a subsidiary of the American Bosch Corp. Last month Art was called back from his early retirement to again head the Arma organization.

Following the Alger tradition, Art began his career as an office boy with General Electric. Nine years later, in 1918, he and David Mahood founded Arma on a shoestring investment of \$1500.

Dave's business ability and Art's genius for redesigning existing electrical devices netted the firm Navy contracts and renown in military instrumentation.

Art retired in '47 to pursue his hobbies: Sailing, photography, music and, of course, experimenting. But life on the sidelines proved too dull, and last month this vigorous engineer accepted an invitation to return to Arma as president.

BIG PRESSES to make



NEW

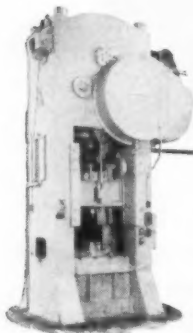
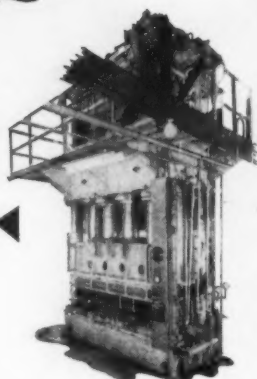
500 TON BLISS MECHANICAL: double crank; bed area 120-in. by 60-in.; shut height 46-in.; stroke 20-in.; with cushions. Trim, pierce, and hole cut operation on vending machine door panel.

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PRODUCTION** [DIE MAKING • COMPLETE PRESS ROOM • MACHINE SHOP
HEAT TREATING • ALL TYPES BRAZING AND WELDING
TESTING AND INSPECTION]

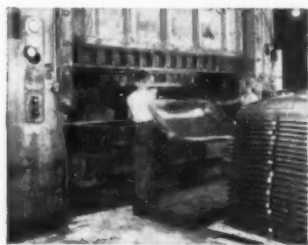
750-250 TON MARION HYDRAULIC: double action; bed area 120-in. by 60-in.; daylight 69-in.; stroke 42-in.; with cushions.

Ready for single action production—cam piercing $\frac{3}{16}$ -in. metals.

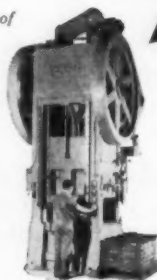


400 TON CLEARING MECHANICAL: crankless; bed area 42-in. by 36-in.; shut height 20-in.; stroke 20-in.; with cushion.

Ready for production of deep drawn stampings.



750-400 TON CLEARING HYDRAULIC: double action; bed area 150-in. by 72-in.; daylight 94-in.; stroke 66-in.; with cushions. Drawing huge truck cab roof.



NEW

250 TON BLISS MECHANICAL: single crank; bed area 33-in. by 39-in.; shut height 27-in.; stroke 14-in.; with cushion.

Blanking and piercing heavy gauge plate.



750 TON WILLIAMS WHITE HYDRAULIC: single action; bed area 48-in. by 96-in.; daylight 60-in.; stroke 40-in.; with cushions.

Drawing $\frac{1}{4}$ -in. NAX high tensile steel for a government part.



2500 TON LAKE ERIE HYDRAULIC: single action; bolster area 120-in. by 59-in.; daylight 48-in.; stroke 36-in.; with heavy duty spring cushions.

Drawing operation on $\frac{1}{4}$ -in. steel cover— $4\frac{1}{2}$ -in. deep.

350 TON TOLEDO MECHANICAL: single crank; bed area 24-in. by 24-in.; shut height 21-in.; stroke 10-in.; with rubber cushion. Ready for production of heavy gauge stampings.



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The Iron Age

INTRODUCES

Martin K. Schnurr, elected president, **ROTARY ELECTRIC STEEL CO.**, Detroit. He succeeds **Nathaniel D. Devlin**, who has resigned.

Donald C. Potts, appointed president, **PITTSBURGH STEAMSHIP DIV.**, Cleveland, U. S. Steel Corp.

Fred A. Collinge elected chairman of the board, **G. M. DIEHL MACHINE WORKS, INC.**, Wabash, Ind.; and **John A. Collinge**, elected president and general manager.

Bartlett Richards, elected to the board of directors, **ACME STEEL CO.**, Chicago.

Hamilton Migel, named to newly-created position of 2nd vice-president in charge of engineering, **MAGNA-FLUX CORP.**, Chicago; **Roy O. Schiebel, Jr.**, named Eastern manager; and **Kermit A. Skeie**, named Midwest manager.

Lester Long, elected vice-president in charge of sales, and secretary, **AMERICAN CAST IRON PIPE CO.**, Birmingham.

Howard K. Chapman, elected executive vice-president, **H. KRAMER & CO.**, Chicago; **Emanuel Singer**, named vice-president in charge of purchasing, and **E. S. Schwartz**, named vice-president and general works manager.

A. N. Whitlock, named controller, **CATERPILLAR TRACTOR CO.**, Peoria, Ill.

Kenneth Palmer, appointed assistant superintendent, Melting Dept., **Sanderson-Halcomb Works, CRUCIBLE STEEL CO. OF AMERICA**, Pittsburgh.

Matt W. Stanley, appointed assistant treasurer, **ALUMINUM CO. OF AMERICA**, Pittsburgh.

Henry W. Armstrong, promoted to vice-president in charge of finance, **JOSEPH DIXON CRUCIBLE CO.**, Jersey City, N. J.; **Joseph P. Templeton**, named secretary-treasurer, and **Walter H. Buckhout**, named controller.

Blair Birdsall, named chief bridge engineer, **JOHN A. ROBELING'S SONS CO.**, Trenton, N. J. He succeeds **Charles C. Sunderland** who has retired.

Bert Woldring, appointed researcher in product and market development, **RAPIDS-STANDARD CO., INC.**, Grand Rapids.

James W. Percy, appointed assistant to the vice-president in charge of sales, **FRUEHAUF TRAILER CO.**, Detroit.

D. B. Craver, appointed general manager of sales, **AMERICAN CAN CO.**, New York.

Edmund Pfeifer, named district manager of sales, New York office, **LUKENS STEEL CO.**, Coatesville, Pa.; **Charles A. Carlson, Jr.**, appointed assistant district manager of sales. Mr. Carlson will have headquarters in Albany.

Harry W. Link, Jr., and **Andrew W. Scharrer**, elected to the board of directors, **U. S. RADIATOR CORP.**, Detroit.

Robert Lange, promoted to manager, Washington office, **HYSTER CO.**, Portland, Oregon.

John F. McDaniel, promoted to manager of marketing, **HOTPOINT, INC.**, Chicago.

Walter J. Simons, appointed assistant treasurer, **CHRYSLER CORP.**, Detroit.



LESTER D. CHIRGWIN, elected president, **Consolidated Machine Tool Corp.**, Rochester.



R. H. BOUNDY, named director of research, **The Dow Chemical Co.**, Midland, Mich.



ROBERT F. BOURNE, appointed general sales manager, **Claymont Steel Corp.**, Claymont, Del., a subsidiary of **The Colorado Fuel & Iron Corp.**

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Personnel

Continued

Charles F. Kaberna, appointed manager, Order & Service Dept., INLAND STEEL PRODUCTS CO., Milwaukee; P. D. Messler, appointed assistant manager of purchasing; and J. Dan Ray, appointed assistant manager, Baltimore branch.

George T. Bogard, named manager, newly-created utility sales department, major appliance division, GENERAL ELECTRIC CO., Louisville.

George A. Most, Jr., appointed district manager, Moline, Ill., LINK-BELT CO., Chicago; Stuart T. Penick, appointed sales engineer, new plant, Colmar, Pa.

A. S. Kingerley, named assistant sales manager, Midwestern District, WOLVERINE TUBE DIV., of Calumet & Hecla Consolidated Copper Co., Detroit.

Neal V. Robinson, appointed merchandising manager of consumer products sales, Chicago office, KAISER ALUMINUM & CHEMICAL SALES, INC., Oakland, Calif.

John M. Ernst, named manager, Installation & Service Dept., AMERICAN MACHINE & FOUNDRY CO., Pinspotters Div., Buffalo Plant.

B. Walter Swanson, appointed factory manager, HANSON-WHITNEY CO., Hartford; and E. P. Cody, appointed office manager, in addition to his duties as general sales manager.

J. A. Hill, named manager of industrial sales, INDEPENDENT PNEUMATIC TOOL CO., Aurora, Ill.; J. F. Corkery, named manager of electric tool sales; and G. A. Thoma, named sales promotion manager.

Stover E. Harger, appointed plant controller, Toledo plant, THE NATIONAL SUPPLY CO., Pittsburgh.

Walter W. Edens, appointed to sales engineering staff, FEDERATED METALS DIV., American Smelting & Refining Co., New York.

Emanuel Gordon, joins the Engineering Dept., where he will be in charge of special pilot plant operations, METAL HYDRIDES, INC., Beverly, Mass.

James W. Hallock, promoted to sales manager, ALBION MALLEABLE IRON CO., Albion, Mich. He succeeds the late Jackson D. Waterbury.



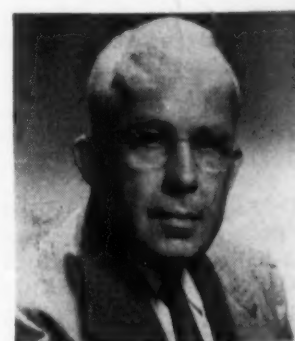
GEORGE D. SHERMAN, named president, Orion, Inc., Bay City, Mich.



W. KENNETH MENKE, elected to the newly-created post of vice-president in charge of chemicals, Pittsburgh Coke & Chemical Co., Pittsburgh.

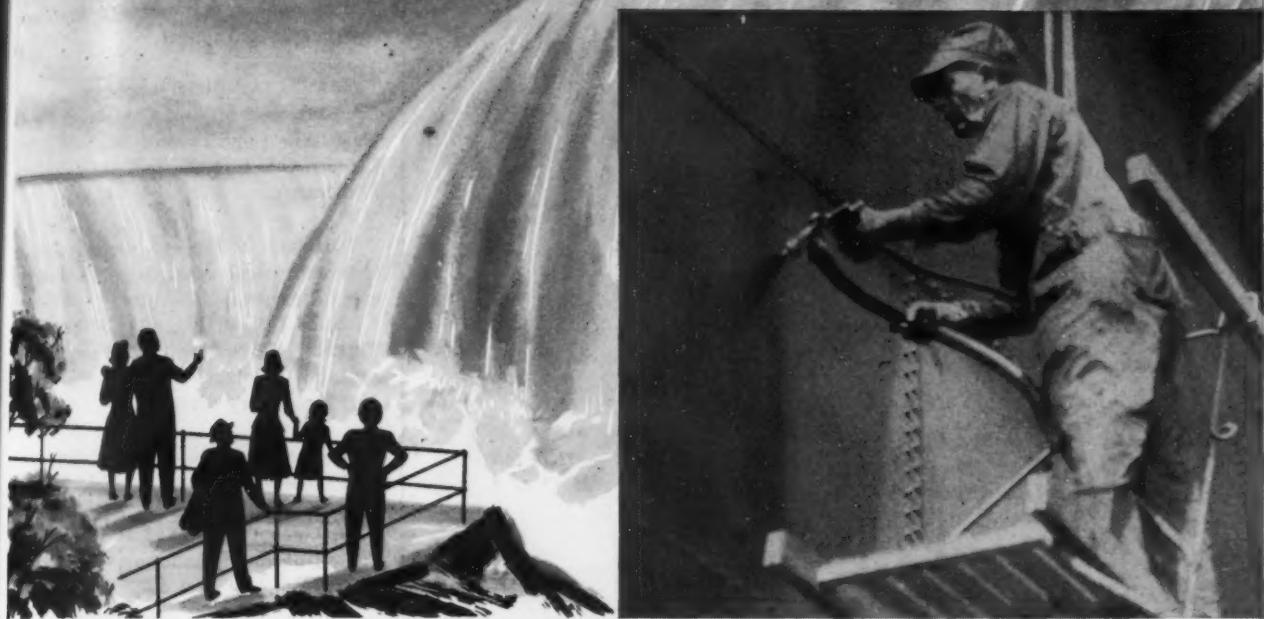


WILLIAM H. FRANKLIN, elected a vice-president, Caterpillar Tractor Co., Peoria, Ill.



GEORGE W. BROWN, appointed executive engineer, Wagner Electric Corp., St. Louis.

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but . . . *only one* Niagara



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Personnel

Robert Cushman, named Pacific Coast district manager, NORTON CO., Worcester, Mass.; **Donald F. Jones**, appointed abrasive engineer, central New York area; and **Kenneth F. Ebbeson**, appointed field engineer, Northeastern District.

Howard A. Blair, appointed product manager of Self-Contained Products, Air Conditioning Div., WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

Theodore E. Meyers, named a sales representative, Los Angeles district office, general machinery division, ALLIS-CHALMERS CO., Milwaukee; **Thomas R. Groff**, named a sales representative, Detroit district office, general machinery division.

William E. Atchley, appointed general sales manager, NATIONAL TWIST DRILL & TOOL CO., Rochester, Mich.; **Frederick D. Lamb**, named assistant general sales manager.

James H. Heroy, Jr., appointed general manager, brush division, PITTSBURGH PLATE GLASS CO., Pittsburgh.

G. W. Kelly, named general purchasing agent, KAISER STEEL CO., Oakland, Calif., and **R. L. Lamborn**, named purchasing agent.

James P. Doyle, named general manager of operations, SOUTHERN STATES IRON ROOFING CO., Savannah, Ga.; and **Cater Lee**, promoted to warehouse supervisor.

OBITUARIES

Meyer Yanowitz, 60, president and founder of Sharon Tube Co., Sharon, Pa.

John Jay White, 69, founder and president, Tube Reducing Corp., Wallington, New Jersey and Stamford, Conn.

Harry O. Johnson, 56, former general superintendent of American Steel & Wire's Central Furnaces & Docks in Cleveland and an assistant in the office of the vice-president-operations of the U. S. Steel Div., at his home recently.

Frederick D. Enterline, 54, purchasing agent for Greenville Steel Car Co., Greenville, Pa.

Fred W. Hoffman, 79, retired supervisor of U. S. Steel Co. mills in Pittsburgh.

RAMMED OPENHEARTH BOTTOMS Increase Production



By Charles Heilig

Manager, Service Division
Basic Refractories Inc.
Cleveland

Rammed bottoms used on 250 ton openhearth at J & L save 3 to 5 days in construction time over former methods. Furnace refractory life is increased by about 10 pct. Bottom installation is simplified, contours are more accurately controlled and no skilled labor is needed to install rammed bottoms. J & L picked up 70,000 net tons of steel production by using these bottoms on 10 furnaces.

By utilizing a relatively new method of hearth construction at their new openhearth shop in Pittsburgh, Jones & Laughlin Steel Corp. stands to gain 70,000 tons of steel. J&L's new shop has eleven 250-ton openhearth capable of producing 2,000,000 tons annually. Ten of the furnaces are making steel on full-rammed bottoms. Openhearth steel producers have a choice today of three types of hearth construction: burned-in; rammed subhearth with burned-in top layers; or full-rammed. The definite trend, as emphasized by J&L's new construction, is toward the full-rammed construction.

This hearth construction method, first considered less than 10 years ago simply as an expedient to meet war demands, has become

accepted practice in a relatively short time. Estimates based on a comparison between the

BURNED-IN vs. RAMMED LINING

- 1—Burning in a bottom requires 8 to 10 days; a rammed hearth, on an average, 5 days. Therefore, approximately 3 to 5 days were saved in getting each furnace into operation; a total of 40 days for the shop.
- 2—Furnace refractory life (roof, sidewalls, etc.) is extended about 10 per cent. Ramming is done in a cold furnace while burning-in requires peak operating temperatures during the entire hearth construction.

"Final density of the bottom is of extreme importance . . . use the upper allowable limit of water content . . ."

burned-in and the full-rammed methods are illustrated here. These two savings alone can be translated into an appreciable steel tonnage. Based on a 20-ton per hour output for each furnace, about 2000 tons are gained per furnace by saving 4 days construction time. For the shop this comes to more than 20,000 tons. With a 200-heat campaign for the average furnace, an extended life of 10 pct means 20 more heats. For each 250-ton furnace this means 5,000 additional tons; for the shop, 50,000 tons of steel.

Summarily, therefore, J&L might expect to pick up, at termination of a complete campaign on all furnaces, a total of 70,000 tons. This initial tonnage gain was not the sole qualifying advantage. Other benefits, provided by construction and proved in service are shown.

Basically, ramming a full open hearth may be broken down into five major divisions: 1) tempering; 2) conveying; 3) ramming the flat; 4) ramming the banks; and 5) conditioning by heat.

Mixing the refractory can be done by hand mixing, conventional concrete mixer or a multi-bladed horizontal batch mixer, Fig. 1. The first two methods are satisfactory but not completely adequate. The manual method is slow, inefficient and, unless carefully supervised, may result in runoff of water which carries with it chemical bonds. The concrete mixer, although it is faster and eliminates water drainage tends to "ball." This segregation of the chemicalized fines reduces the homogeneity of the mixture and, in turn, necessitates reworking the mixture prior to ramming. The multi-bladed mixer has practically

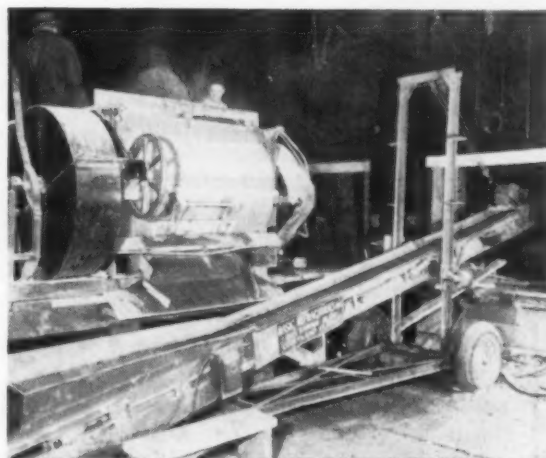


FIG. 1—Ramming material mixer and conveyor in operation at J&L's new openhearth shop. Note that in this case feed is direct from the mixer into the furnace.

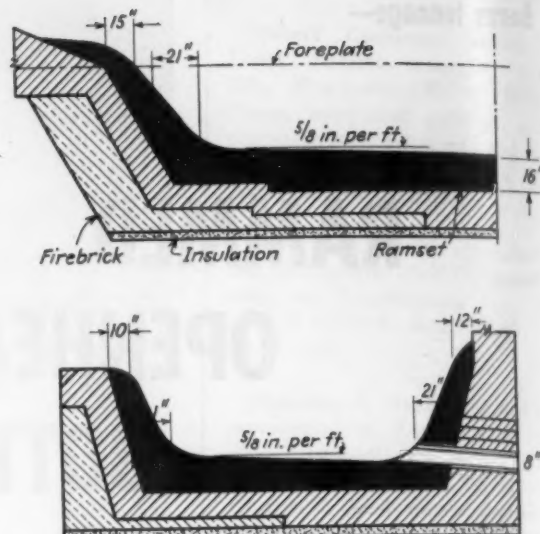


FIG. 2—Schematics of the wooden forms prepared prior to installation of rammed bottom. Depths specified on these drawings are those used on J&L's new openhearths.

eliminated the balling tendency and has speeded the mixing to about 25 tons of mix per hour.

It is not possible to stipulate a definite water addition. Furnace and atmosphere conditions and lapse between mixing and ramming are examples of conditions which may require a variation in water content. Check on water content must be maintained not only at the mixer but in the furnace. If the mix does not compact well too little water is being used. If, on the other hand, the material becomes spongy under the rammer, too much water is being used. Sponginess results in laminations and all sections exhibiting this behavior must be removed and re-rammed. Final density of the bottom is of extreme importance. To obtain maximum density it is better to use the upper allowable limit of water content rather than the lower limit.

A man wheeling tempered mix to a furnace

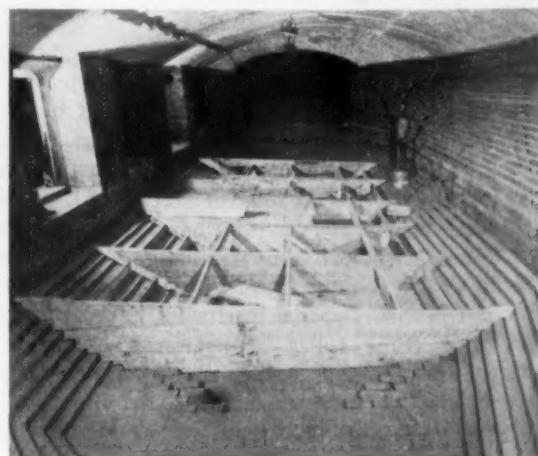


FIG. 3—Wooden forms in place for ramming flat. The forms taper from all directions toward the tap hole. A center tap-hole section is rammed without a joint.

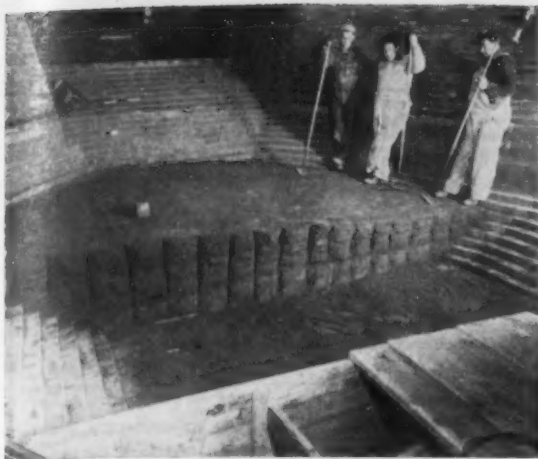


FIG. 4—Forms have been removed from end section. The heavy scoring was done by pick to assure firm bond at joint.

is at the complete mercy of the charging buggies. Each time a buggy blocks access to the furnace, flow of material to the job stops. To eliminate this stoppage, Basic Refractories designed the conveyer shown in Fig. 1. Sufficient versatility has been designed into the conveyer to permit unhampered flow of material directly into the furnace.

Backfill tampers remain the most effective ramming tools. These rammers have a stroke of from 5 to 6 in. and operate efficiently on 80 to 100 lb of air pressure. An air manifold equipped with a lubricator and a sufficient number of taps and shutoff valves to convey air to each rammer is recommended to reduce to a minimum the

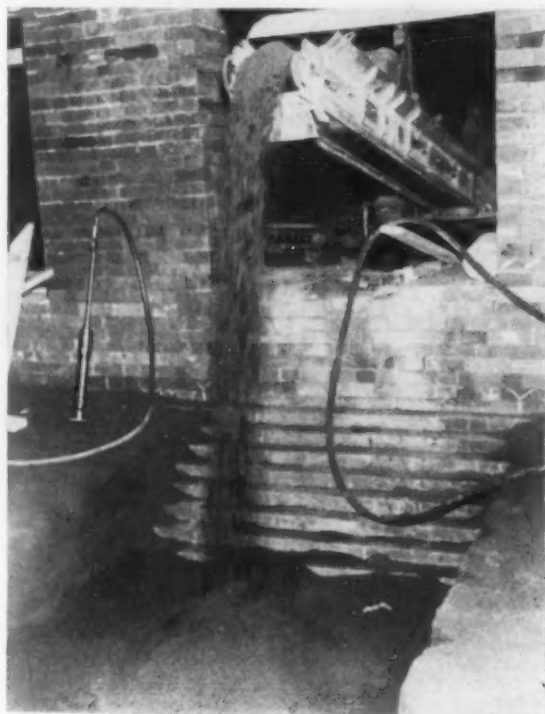


FIG. 5—Conveyor pouring mix for center section into the furnace. Ramming is continuous until complete.

amount of hose required. The number of tampers used per job will vary. Eight were used in each of the J&L furnaces.

An improvement in ramming equipment, developed by Basic, is in the rammer butt. By decreasing butt diameter and making the butt end more convex, it has been possible to increase rammed density.

From drawings showing desired rammed depths, wooden forms are constructed, Fig. 2, and placed in the furnace, as shown in Fig. 3. These forms are cut to the proper taper so that the final contour is obtained. The flat is always divided into an odd number of sections so that there will be no joint at the tap hole. Working from the ends toward the tap hole, the work crew rams each section full before proceeding to the next. Ramming must be sufficient to avoid the possibility of air pockets and voids thus to prevent the build up of excessive pressures (steam) which may result in spalling during the heating up period.

Recommended practice is to place and roughly level the mix to a depth of approximately 3 to 4 in. A series of at least 3 heavily lapped passes of the air rammers in one direction and an equal number of passes in the opposite direction gives an approximately 40 pct reduction and a good density. Before successive layers are laid, the rammed surface should be tested with a hammer. Much as with the conventional metal harness tester, the indentation made by a ball-peen hammer will indicate the hardness of the rammed layers.

When a layer is thoroughly compacted, the surface is scored or otherwise roughened, preferably with a rake. This loosening insures a firm bond between successive layers and minimizes the possibility of lamination. This procedure is repeated until the entire section is rammed. After the vertical forms have been removed, Fig. 4, the exposed surface of the rammed section is heavily scored, usually with a pick. As in the case of the horizontal layers, this scoring assured strong bond at the joints.

Fig. 5 shows the conveyer bringing the granular refractory to the center section which is the last of the flat sections to be rammed. Ramming is continuous until the installation is complete. If ramming must be discontinued for several hours, it is advisable to use wet burlap bags to cover the exposed areas of compacted refractory, on or against which additional refractory is to be rammed. When work is resumed, particular attention should be devoted to scoring the rammed surface which has been covered.

"Ramming must be sufficient to avoid the possibility of air pockets . . . may result in spalling . . ."

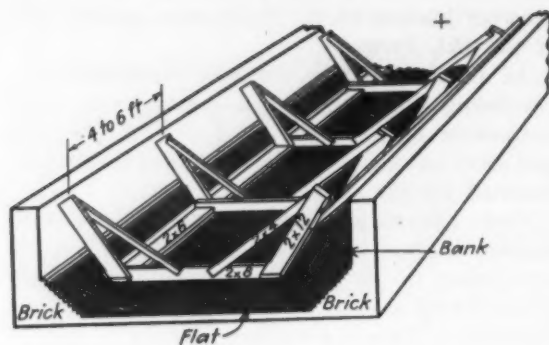


FIG. 6—A schematic drawing of wooden frames erected on flat or ramming of banks. Note board sizes, spacing.

FOUR MORE SAVINGS

- 1—Bottom delay time is, at least, on a par with that of the burned-in hearth.
- 2—Installation is simpler and, simultaneously, the bottom contour (flat, end banks, etc.) accurately controlled.
- 3—Skilled manpower is conserved. Relatively unskilled labor install rammed hearths and valuable furnacemen are released for steelmaking.
- 4—Hearth uniformity is assured. No slag or other non-refractory diluting agent is required. As a consequence the hearth has a uniformly high periclase (crystalline magnesia) content.

RAMMING THE BANK

FIG. 7—Ramming bank over tap hole. The work has proceeded to second board level.



FIG. 8—Job has progressed to third board level.



FIG. 9—Leveling refractory to top of fourth board prior to ramming.



FIG. 10—Banks proper have been completed and port slope is nearing completion.

RAMMED BOTTOM CONSTRUCTION RECORD

Company.....	Jones & Laughlin Corp.	Shop Number: #4
Plant.....	South Works	Size of Furnace: 250-ton
Location.....	Pittsburgh, Pa.	Furnace Number: #32
Personnel.....	Same	Fuel Used: Oil & Gas
		Reason for Repair: New Installation
		Nature of Repair: Fully rammed

Equipment Used	Power	Bottom Construct on
Mixer.....	Yes	1 inch Plate
Conveyor.....	Yes	3 inch Insulation
Hammers.....	Eight	9 inch Chrome Brick
Impactor.....	No	8 inch Magnesite brick
Forms.....	Complete	15 inch Ramset

	Date	Time
Start Ramming Flat.....	12/4/51	5:30 pm
Complete Flat.....	12/6/51	1:30 pm
Start Ramming Banks.....	12/5/51	1:30 pm
Complete Hearth.....	12/6/51	2:00 am

TOTAL TIME..... 32' 30'
AMOUNT OF MATERIALS..... 341,600#

Flat	Dimensions	Frontbanks	Dimensions
Taphole.....	15"	Base	21"
Ends.....	30"	Sill Line	10"
Slope.....	5/8" per ft.	Height	34"
Backbanks	Dimensions	Endbanks	Dimensions
Base.....	21"	Base	21"
Slag Level.....	12"	Slag Level	15 1/2"
Height.....	60"	Height	54"

Heating Schedule	Date	Time
Time first heat applied(Perforated Pipe).....	12/6/51	4:00 pm
Time burners started.....	12/7/51	3:15 pm
Time temperature reached.....	12/9/51	4:00 pm
Burning time.....		

Slag Bath	Pounds	Date	Time
Slag used.....	15,000	12/10/51	8:00 pm to 8:45 pm & 7:00 pm to 7:50 pm
Slag Tapped.....	2,000	12/10/51	8:15 pm

Bottom Chilled	Date	Time	Bottom Dressed	
Oil Off.....	12/10/51	8:20 pm	Raw Dolomite x	Banks
Oil On.....	12/10/51	8:50 pm		Burned Lime x

	Date	Time
Furnace Charged.....	12/10/51	9:05 pm
Furnace Tapped.....	12/11/51	11:15 am

When the flat has been completed, its dimensions are checked against specifications.

Special forms are constructed to shape the banks, Fig. 6. As with the flat, these forms are dimensionally in accord with the specified contour. As can be seen in the schematic drawing and Figs. 7 through 10, the banks are rammed in layers, the depth of each layer being to the



FIG. 11—Finished rammed bottom. Note taper in all directions. Furnace is burned in, inspected for cracks.

top edge of the boards forming the face of the bank. As with the flat, each finished layer is tested and scored before successive layers are rammed.

The use of bank forms permits vertical ramming. Some still ram perpendicular to the bank angle although this method has not been found to yield maximum density. With the end banks complete, the forms are removed and the hearth ramming is done. The finished hearth is shown in Fig. 11.

Usually the furnace is held at normal operating temperature for a minimum period of 24 hr. Any cracks which appear during this period are filled by dusting the hearth with dry refractory mix. Upon completion of the burning-in period, the banks are coated with ground basic open-hearth slag until sufficient molten slag has accumulated in front of the tap hole to insure a clean tap. The slag is then drained, the furnace shut down and allowed to chill for 45 to 60 min or until cracks appear in the hearth.

The furnace is again raised to operating temperature and held there until the cracks seal. Any cracks which do not close after the furnace has been at temperature for an hour, are sealed with dry refractory and operating temperature maintained for another hour. A light coating of burned lime or raw dolomite is applied to make the furnace ready for charging. From mixing to the heating up cycle after which the furnace is ready to charge, the time required for the installation of a fully rammed hearth averages 5 days.

Better parts for less—

Good Design

Can Cut Die Casting Costs



By W. M. Halliday
Consultant
Southport
England

Better and cheaper pressure die castings are possible with simple modifications in part and die design. These aim at speeding production and reducing die costs. Proper draft allowance and design and location of cores are important. Ejection may be by stripping cores or pins. Parts designed with proper location of parting line speed die action. Good design can reduce flash, simplify removal.

Pressure die castings varying only slightly from parts made by other methods, can often be produced at considerable savings in costs.

Best results and economies are possible where the die casting engineer and die designer have some latitude in duplicating shapes, forms, features, sizes and tolerances.

Full advantage of the die casting method may best be obtained where parts are designed to meet the limitations and possibilities of die casting and of die construction.

The importance of this approach is illustrated by the decorative beading, Fig. 1, in zinc-base

alloy, for use with a plastic molded car bezel. This die casting replaced hollow light gage aluminum pressing. A die cast part was selected because of the ability to cast-on critical rivets and provide a component capable of withstanding handling during polishing, electro-plating and mounting.

The casting comprises a long strip, U-shape in cross-section and curved along its entire length to match the camber of the bezel.

Four lugs, elliptical in cross-section were to be cast on the underside of each beading. A V-notch was to be formed in the top of each lug.

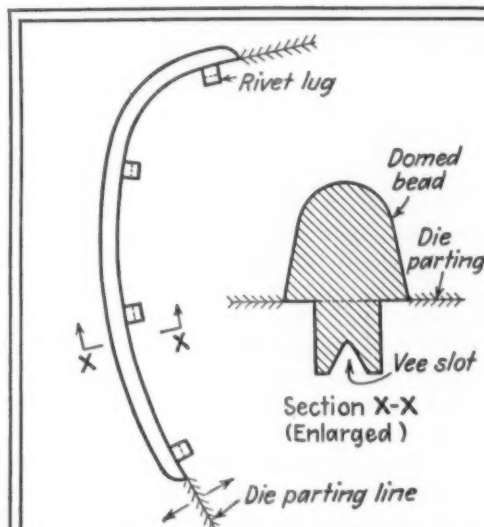


FIG. 1—Decorative zinc alloy beading replaced light gage aluminum pressing, gave stronger, cheaper part.

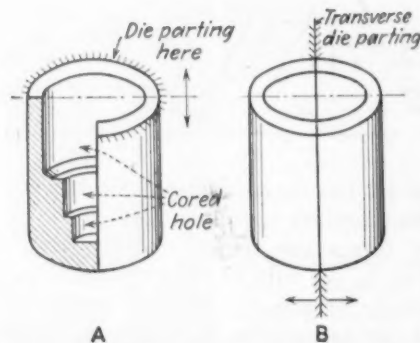


FIG. 2—Simplest die parting, A, would be located across upper open end. Middle parting, B, raises costs.

The die for this casting was costly due to machining difficulties in respect of the awkwardly curved parting joint, to obtain a close seal thereon, and the location of elliptical cavities for rivet lugs.

The die was slow in action and difficult to operate. Because of the inclination of the lugs relative to normal direction of die opening, these portions deformed and misaligned to each other due to lengthwise shrinkage before parts could be ejected.

Heavy flash was also present on the sides of the cast beadings due to poor sealing on curved die parting joint. High breakage occurred with the slender V-shaped core plugs because of heavy contraction strains.

The 4-cavity die produced only six castings per minute. It was decided to cast the beadings straight and bend them to shape. Bending tests indicated the parts could be bent quickly and safely while still hot by a hardwood fixture.

A new die with a flat parting joint eliminated several difficulties of the original die. Lug cavities, formed at right angles to the parting joint and lugs were not distorted. Less strain was imposed on cores. Flash was negligible due to the closer seal on flat parting joint surfaces. Ejection of headings was quicker, and safer.

The new 4-cavity die permitted four shots or 16 castings per minute, $2\frac{1}{2}$ times that obtained previously.

Simple part designs generally mean reduced costs, on both castings and dies, together with quicker working and greater durability.

Quantity of parts to be made also influence cost and quality. Where die costs must be amortized over a small quantity, say 10,000 parts, the die caster must evolve the simplest and least expensive die capable of making this many parts.

Such a die will usually be of the single impression type, unfitted for long runs. Indications should be given the die caster at the out-

set as to possibilities regarding future quantities. Provisions may be made for inserting additional cavities at a later date if production has to be stepped-up. Better die materials may be used to ensure longer working life.

Another cost factor is that of proving the die. Dies of simple design involve the least difficulty.

Die costs are closely related to part design and length of tool life. A complex die, due to wear, distortion of die elements, and fatigue of materials due to heat exposure may have a working life of 40,000 shots, even with the low melting point alloys. A simpler die may produce upwards of 250,000 shots in low melting point alloy before showing appreciable signs of wear.

For simple shapes, in small quantities, dies of mild steel, unhardened, may yield 30,000 shots with a zinc-base metal before serious wear appears.

Avoid delicate, fragile cores

For high melting point alloys, heat-resisting tough die steels, hardened, are recommended despite higher cost. Maintenance requirements will be lower.

Very small holes of great depth or awkward inclination to main die parting should be avoided. They require delicate cores, mounted to slide, rotate or collapse to allow for ejection of casting. They are fragile and involve high maintenance, production delays and extra cost. Likewise part shapes necessitating irregular parting joints lying in two or more planes will often lead to faults and wear in the die.

Die quality affects accuracy and surface finish of castings. When planing a die casting the designer should be guided by several rules.

Split steel dies require at least one main parting joint to seal within 0.001 in. on a band $\frac{3}{4}$ in. wide around edges of cavities, runners, gates, and air vents. Dies should split to permit easy machining of cavities and ejection of finished

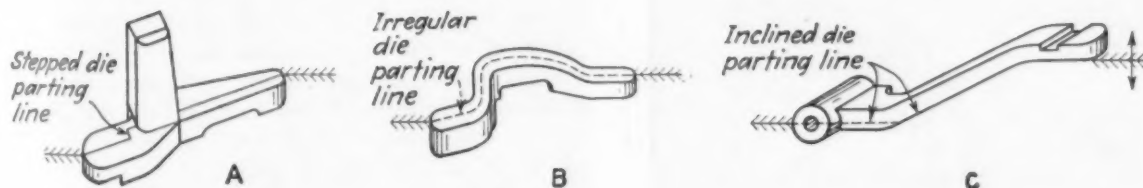


FIG. 3—Alternate parting joints are shown. Flash removal for A and B would be difficult. Dies are parted in stepped fashion, flash is extensive. Fulcrum lever at C shows an inclined die parting line.

Heat-resisting, hardened die steels are recommended . . .

casting. Castings tend to shrink away from cavity walls, and grip upon hole-forming cores.

Parting joints should be flat, straight and in a single plane. Irregular parting points are difficult to machine and slow die operation.

Cores may be integral with cavity walls, or separate members mounted in the die to interject into the cavity. Cores, fixed or movable, may rotate, slide, or rock in the die. Movable cores require mechanical actuation. Most convenient mechanism permits cores to be worked automatically by normal opening movements of the die.

Projections, undercuts and similar formations athwart the line of die opening and wider than the cavity at the parting joint retard ejection.

To facilitate ejection, draft must be provided on cavity walls and sides of cores. Minimum practicable draft will be about 1° per side, except with holes of large diameter and very short length. The greater the taper allowed the simpler will be ejection. Such taper also reduces the delay between injection and ejection, thus dimensional tolerances can be controlled more easily to offset the effects of normal shrinkage.

Ejection may be accomplished by movable stripping cores in a slide or by rods which push the casting off stationary cores. This latter method, generally most effective from die construction and operation angles, entails some collar flash on sides of casting where rods impinge on the part.

Size, number and location of ejector rods are important to equalize pressure on the part when stripping.

Adequate venting channels must be provided

—usually along main parting joint surfaces to ensure proper fill of the cavity and avoid porosity.

Physical properties of the part are often influenced by the gating used. Intricate, large, or extensively cored cavities may offer gating problems which can only be overcome by modifications of part design.

Thin wall sections as small as 0.020 in. for zinc-base alloy, and 0.055 in. for high melting point alloys can be readily cast. Thick sections, tend to be porous and weak. Ribs, beads, bosses and fillets at points of greatest stress can often increase strength and rigidity of casting walls without appreciably adding to the amount of metal used.

Ribs, beads, fluting, filigree impressions, lettering and similar ornamentation can be cast-on without difficulty but should be in raised characters on sides of component. Obverse impressions require costly machining.

Large flat surfaces are uninteresting, tend to show highlights, and tend to emphasize minor surface blemishes. By using slightly cambered surfaces, broken by flutings, stripping or knurling, such defects are most easily hidden.

Fine tolerances cost more

Fine tolerances generally involve additional die costs and greater care in its use. Dimensional accuracy will largely be conditioned by part design and accuracy of the die.

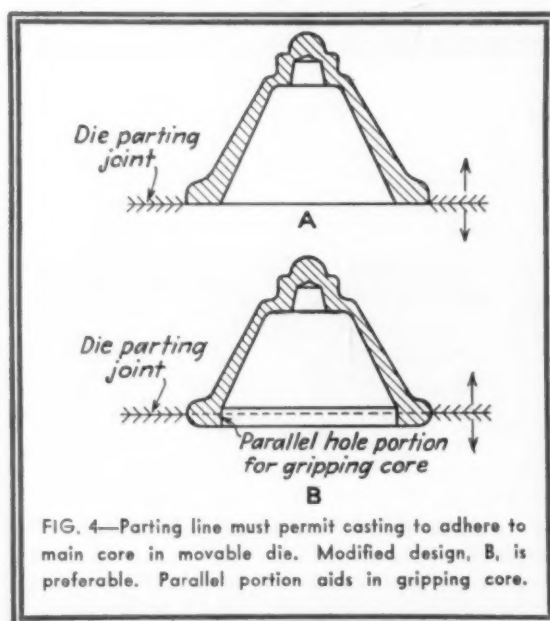
Closest accuracy is possible with low melting point to alloys since better control can be obtained over normal shrinkage of cooling metal in die cavity, and expansion and contraction of the die itself.

Some flash must be expected along the main parting joint. This should be conveniently located for removal by trimming die, preferably on an unimportant surface as appearance is concerned.

Use of multiple cavity dies depends largely on the castings form, size, volume of metal, and the ability to dispose the several cavities relative to the sprue to give balanced feeding and ejection.

Inserts in the form of sleeves, rings, nuts, springs and studs can usually be incorporated in the casting walls. Holes and difficult shapes may be easily reproduced, and delicate cores, or weak projections in the die cavity are eliminated.

When a die casting is to be used in a large assembly it may often pay to combine two or more parts into a single casting. Two or more simple die castings may advantageously replace a single intricate part, simplifying die design and increasing production.



Many designers have difficulty locating the parting joint on the part. Generally a die should be parted along the line of greatest dimension on the part. Maximum diameter of the cavity formation will lie at the parting joint surface and permit the casting to be ejected at right angles to the joint.

With most die castings, two or more parting lines will usually be available, as in A and B, Fig. 2. The simplest die parting, A, is situated across the upper open end. The exterior of the sleeve would thus be formed from a single cavity in the stationary die. A three diameter core would be mounted in the movable die half. Ejection is accomplished by withdrawing the core within the die, or using ejector rods bearing against the endface of the casting.

Flash around the open end of the casting could be easily sheared off by pressing the sleeve through a die. Surface finish would be good, with no flash lines transversely around the part.

An alternate parting method, B, runs transversely around the middle of the sleeve. This involves higher die costs. Two identical cavity formations are required in each die half. Such cavities must be closely matched to avoid off-setting. Flash around the middle of the casting would be more difficult to remove.

The solid core plug would have to be mounted in a vertically acting slide carried in guideways in one die half. Provisions would be required for actuating such a slide. Dimensional accuracy

could not be closely maintained. Dowels would be needed to maintain alignment of die halves. Wear at these points would cause serious off-setting of the cavity formations. With the die parting shown at B multiple cavities would have to be located side by side so that all cores could be operated in one direction.

Examples of stepped, irregular and inclined die parting joints are illustrated at A, B and C of Fig. 3. At A is a part which would require a die parted in stepped fashion as shown. Flash would be extensive, much of it inaccessible.

At B of Fig. 3 is a lever requiring an irregular parting joint. Machining and accurately sealing such joint surfaces would be difficult and costly. Flash removal would be difficult.

A fulcrum lever, Fig. 3, C, has an inclined die parting. Flash occurs mainly along the lower edge of the setback inclined portion, and the center of the cylindrical base, left.

The parting line plane has to be located to allow a casting to adhere to the main core etc. mounted in the movable die as illustrated by A and B, Fig. 4.

The hollow conical casting, A, has the die parting joint situated across the bottom endface, the casting being formed from a cavity in the stationary die. Such a design would not insure the casting adhering to the conical core to draw it from the cavity. The modified design shown at B is more satisfactory. Here the flange at the end is beaded. A short parallel portion is provided for gripping to the core.

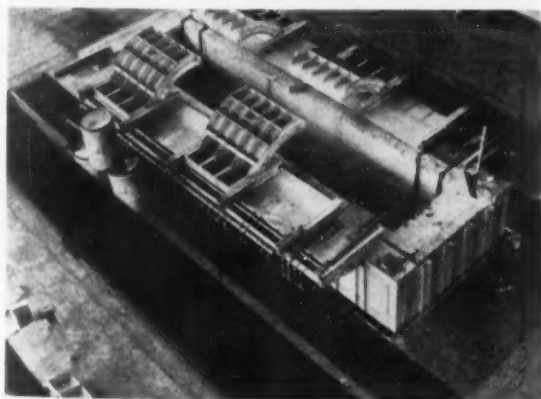
BIG SALT BATH heats steel forging billets

The world's largest salt bath operating at 2350°F is being used at the U. S. Air Force Experimental Plant at Adrian, Mich., to heat steel billets for press forging. The plant is managed by Bohn Aluminum Corp.

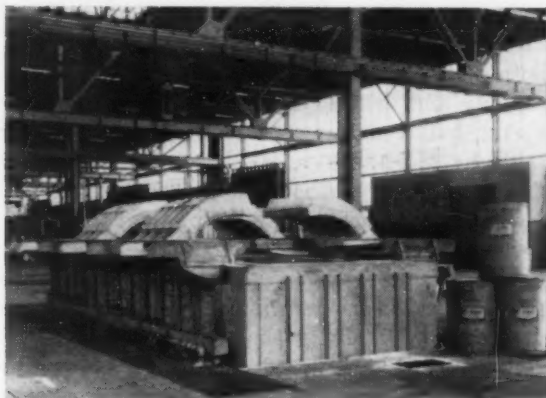
The neutral salt bath is 20 ft long, 4 ft wide

and 10 ft deep and contains approximately 64 tons of salt.

Capacity of the furnace is 5,000 kw. Neutrality of the salt bath is maintained by four Park Chemical Co. Neutra gas units. Delivery tanks for purifying the gas are 12 ft long.



SALT BATH at U. S. Air Force experimental plant, Adrian, Mich., will heat steel billets for forging.



CAPACITY OF THE furnace is 5000 kw. The bath, 20 x 4 ft, and 10 ft deep, will hold about 64 tons of salt.

61 CLOSE-SPACED HOLES drilled with one clamping

By W. G. Patton
Asst. Technical Editor

Automatic drilling and tapping of 61 blind holes in the inside diameter of a turret ball bearing ring for tanks, without reclamping the part, required some unusual engineering planning and tool control. The problem was solved by an automatic machine of unusual design operating at six different levels but the key to success was novel use of the simple universal joint. Drill, tap feeds and speeds are variable.

A new drilling and tapping machine recently placed in operation at the Detroit Tank Arsenal uniquely solves a problem in multiple drilling. The holes vary in size and are too closely spaced to permit drill heads to operate simultaneously at 61 different locations.

By dividing the holes roughly into three groups and operating at six different levels, drilling and tapping of 61 blind holes ranging in size from $3/16$ to $5/8$ in. is accomplished.

The new machine, designed by Empire Engineering Co. and built by Oval Tool and Die Corp., both of Detroit, is expected to reduce the cost of tapping and drilling the inside diameter of the turret ball bearing race ring used for Army tanks by 98 pct.

The tank turret ring is more than 6 ft in diam. No subsequent heat treatment of the part is performed.

The machine, which cycles automatically, replaces a previous operation in which holes were drilled individually with the aid of a fixture equipped with hardened bushings. Using the previous method, drills and taps had to be changed frequently. Several clampings of the part were required. Only a single clamping is re-

quired with the new machine and drills and taps are replaced only as they require resharpening.

Employing the earlier processing method, two race rings were produced during an 8-hr day. Three machines occupied approximately 600 sq ft of floor space, requiring six operators.

The new drilling and tapping machine occupies 200 sq ft of floor space and produces 40 pieces during an 8-hr shift, using two operators. The machine is more than 8 ft high; it can be operated automatically or manually.

Fig. 1 shows the machine as it appears on the floor of the Detroit Tank Arsenal.

The new machine has three different systems of actuation, each of which is dependent on the other. Electrical energy is employed for power and control devices; a hydraulic system actuates the clamping components; pneumatic pressure actuates the rapid traverse features of the machine.

The electrical system is the intelligence of the machine. Start and stop buttons and indicating lights are mounted on the control panel shown in Fig. 1. Indicating lights tell the operator (1) when the drive motor is operating, (2) that the hydraulic motor is running, (3) that the ma-

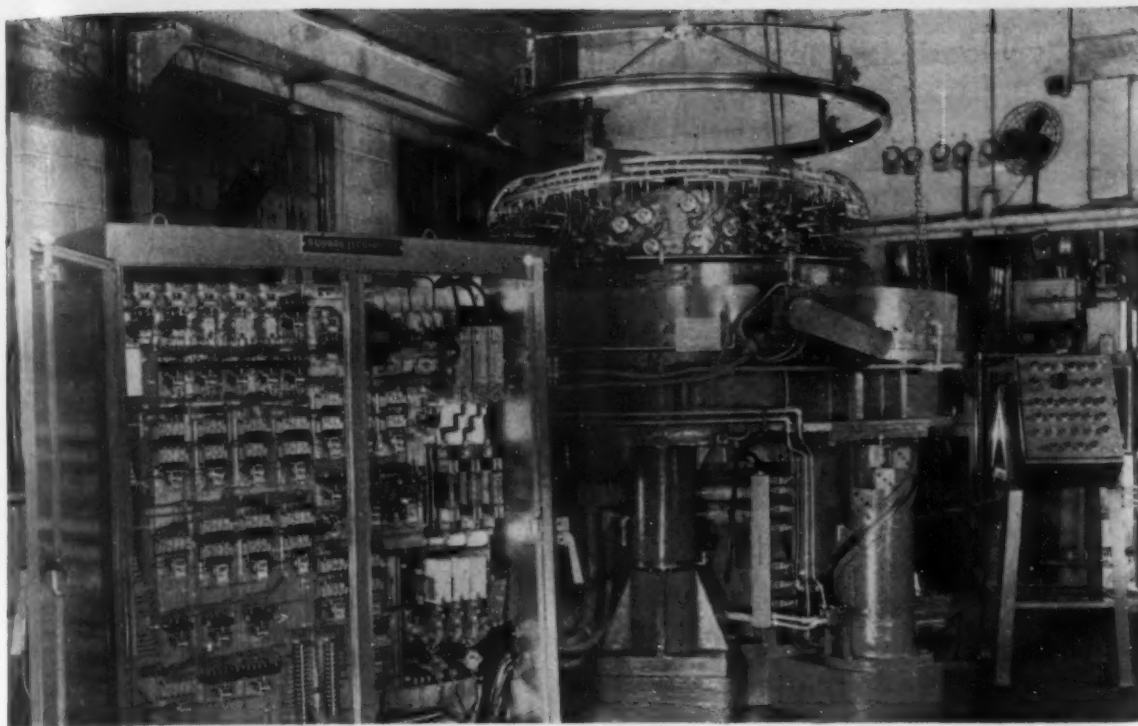


FIG. 1—Control panel and the new automatic drilling and tapping machine for tank turret rings recently placed in operation at Detroit Tank Arsenal. In the photograph, a race ring is being lowered into position for machining.

chine's lubricating system is operating, (4) that coolant is being supplied to the tools, (5) that adequate air supply is available.

By means of a selector device mounted on the control board a signal is transmitted to the main control panel where relays and timing devices are located. These relay messages to the various controlling valves, limit switches, clutches and stops. The timing stages and the sequence of events is governed by limit switches, so positioned that when the displacement of a mechanical member occurs, it sends a message to the main control panel. This, in turn, carries an impulse to the specific control device.

Safety features are designed into the machine to prevent damage to tooling in case of a power or other type of failure.

The control devices in the main control panel operate on 110-v, 60-cycle, ac power supply. The prime movers operate at 440-v, 3-phase, 60-cycle, ac. The small motors, lubricating pump motor and three outboard drilling units operate at 110-v, 60-cycle, ac.

A description of a complete cycle of the machine is given in accompanying box.

The hydraulic system moves the drilling spindles in and out, feeds and retracts the drills and also actuates the clamps. Lifting of the work table to the six different levels of drilling and tapping is also accomplished by hydraulic means.

Pneumatic devices actuate the tapping spindles, both to feed and retract. Pneumatic power also makes possible clutch engagement of the drilling drive and the tapping drive, as well as indexing of the gage cylinders.

To equalize as nearly as possible the time required for the various operations as well as promote satisfactory tool life, spindle speeds range from 415 to 1380 rpm. Speeds are controlled by the selection of gears mounted in the main power column of the machine.

Starting with the 40-hp main drive motor, power is transmitted through the main transmission which has one input and two output shafts equipped with clutches. One of the output shafts is in direct drive for the drilling spindle drive head. The other output shaft permits the desired amount of reduction in speed; it reverses direction to withdraw the tapping spindle drive heads.

A second transmission, powered by the main

SEQUENCE OF OPERATIONS

1. Insert turret ring at top level.
2. Clamp at 8 locations.
3. Lower ring to bottom drilling level of the machine.
4. Rapid forward traverse by one-third of drills.
5. Drill approximately 20 holes.
6. Rapid retraction of drills.
7. Raise to 2nd level.
8. Drill one-third of holes.
9. Raise to 3rd level and drill remaining holes.
10. Raise to 4th level and tap one-third of holes.
11. Raise to 5th level and tap one-third of holes.
12. Raise to 6th level and tap remaining holes.
13. Automatic unclamping.
14. Remove ring from machine.

Rapid traverse features apply to all drilling and tapping operations. Cycling time is approximately 10 min.

Overload clutches on tapping spindles control hole depth . . .

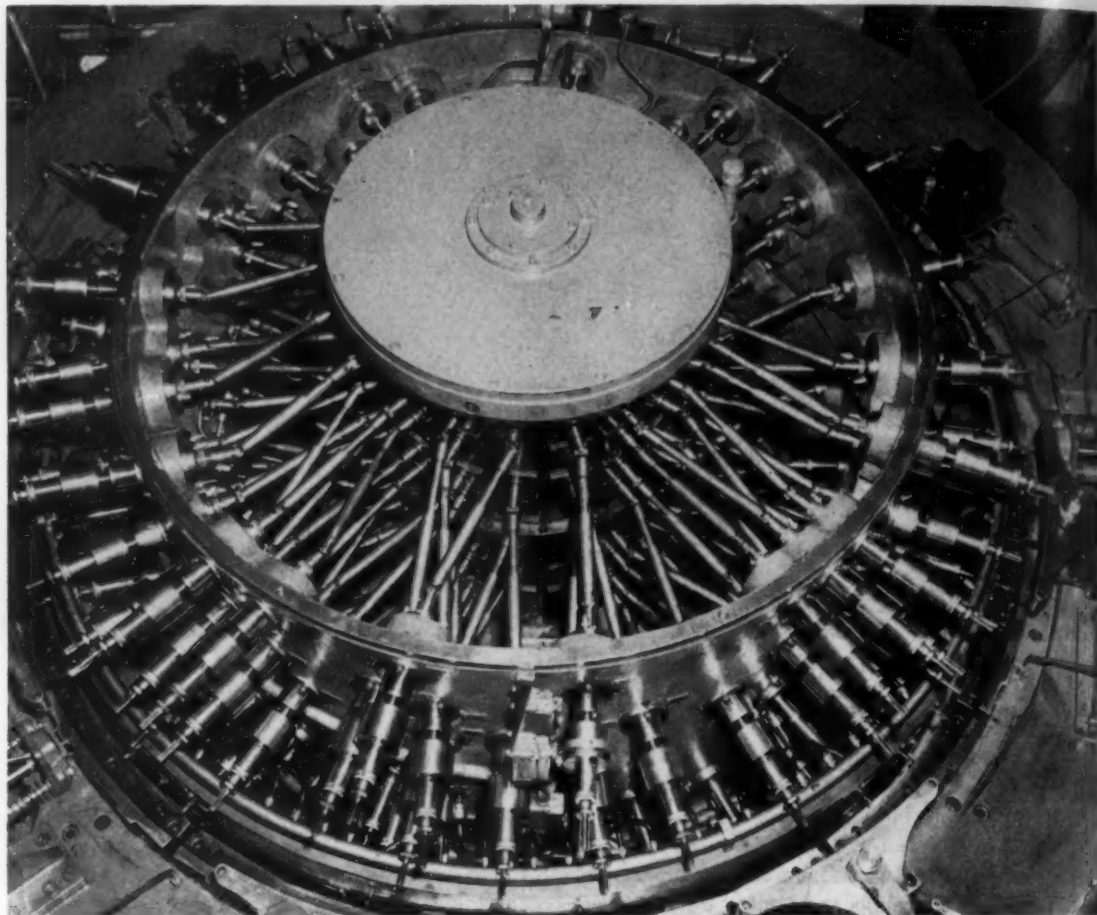


FIG. 2—Power for drills and taps is conveyed from gears to spindles through 122 universal joints. In addition to variable feeds and speeds of drills and taps, the machine has rapid traverse for all tools.

transmission, has two sets of bevel gears at 90° within the body of the machine. Output shafts of the second transmission drive the spindle drive heads which drive the drilling and tapping spindles. As shown in Fig. 2, 122 universal joints are employed to transmit power from the gears to the spindles. The machine also drills three out-board holes on the race rings.

After the spindles start to rotate, drilling and tapping heads advance automatically. Retraction is accomplished by fluid pressure. The drilling spindles also respond to oil pressure. Tapping spindles, however, are actuated by air pressure. Tapping spindles have an additional feature; they are equipped with overload clutches which overrun when the tap bottoms in the hole.

The work table is lifted by hydraulic pressure. Hydraulic cylinders are employed as guiding members for the work table as it is raised from one work level to the next. Cylinders are 120° apart and are mounted on the base of the machine. Three work levels are used for drilling and three levels are used for tapping.

The sequence of operations starts when the work table is at the bottom position and pro-

gresses upward. The position of the work table at the six different levels is determined by the rotation of a gage cylinder, actuated partly by a cam device and partly by action of an air cylinder attached to a cam roller.

Clamps are also actuated by a hydraulic cylinder. Clamping effort is accomplished by a wedge cam, working against the clamp. The clamp is advanced and retracted, to and from the work, by the wedge and cam block.

As shown in Fig. 1 the machine is of circular design which lends itself naturally to rugged construction. The 3-point rest, or tripod, feature of the work table supporting members that rest on the gage cylinders, provides an accurate means of alignment between the work and the engaging component parts at each level.

Four circular distribution manifolds located at the top of the machine convey air to the tapping spindles. Three other manifolds carry coolant to the taps. Another circulating manifold conveys coolant to the drills.

Radially positioned flat bars with the ends bent down serve as rails to guide the work into position during loading. The work is always loaded and unloaded with the table at top position.

Close control gets you more sinter—

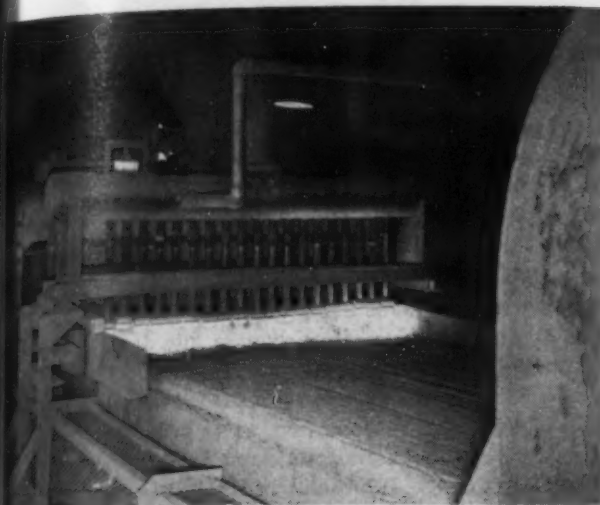


FIG. 1—Open type ignition burner is low in original cost. Maintenance is simple and fuel costs are low.

SINTER PRODUCTION tied to plant design



By Martin L. Cover
Consultant
Allen Park, Mich.

Close control of operations and a carefully designed, well maintained plant are necessary for top production of high quality blast furnace sinter. Materials should be 70 pct or more minus 100 mesh and practically all under $\frac{1}{8}$ in. These should be well mixed, have a carbon content of 4 to $4\frac{1}{2}$ pct, and moisture content ranging from 6 to 10 pct. Open type ignition burners are low in original cost and have low maintenance and fuel costs. Slow air cooling gives the strongest sinter. All wind boxes may be used for sinter production if water cooling is used. Appearance, heat of bed are guides.

Maximum production of highest quality sinter can be attained only in a carefully designed plant systematically operated and maintained. Ease of maintenance is important and complete control of the entire operation is necessary at all times. A sintering plant should be as simple as possible.

Where twin machines are used, material receiving and storage facilities should be separate.

For efficiency, facilities should parallel the sintering machines. Bins of more than 3500 cu ft are less efficient. Equipment should be above ground for safety.

When best bed depth has been determined for available vacuum and materials being sintered, it should not be changed. Hourly pan weights of materials in the mix, including hot fines and fuel, should be recorded so proportions can be kept constant and the rate at which each material is being used can be determined.

Changes in the proportion of raw materials should be made only when necessary. This applies especially to materials, such as flue dust, that contain fuel. When either proportions or bed depths are changed, some time and adjustments are necessary to again get best results. Feeders for fuel and all materials except hot fines, should be connected in parallel.

When wind box cooling is not used, the last wind box should be held at about 500°F. Feed and machine speed can be varied to maintain this temperature. Returns should be controlled to suit the mix and should be kept clean. If contaminated, raw materials should be cut back and the proportion of returns increased to use up the contaminated returns quickly. Proper use of individual wind box dampers and variable vacuum fan speed, during shutdowns, will keep contamination to a minimum. When an open type ignition burner, Fig. 1, is used, the best percentage of carbon can be accurately judged by appearance of the ignition and the bed temperature just after ignition. The thermocouple of a recording pyrometer placed near the bed at this point records bed temperatures.

Moisture content can be accurately judged by appearance of the mix at the swinging spout and by bed ignition. Automatic control of any of

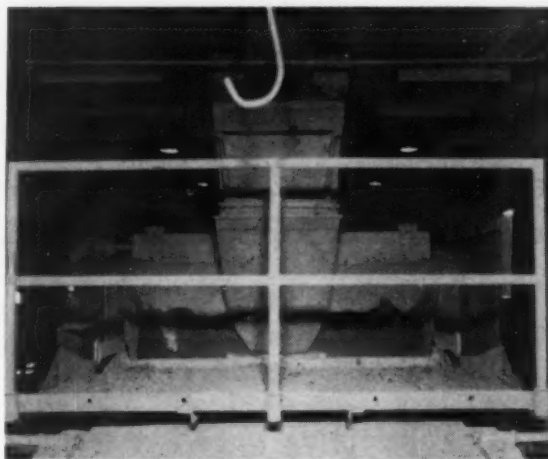


FIG. 2—Swinging spout design has important effect on production. Spout shown feeds materials to either side.

Method of pug mill feed to sintering bed important . . .



FIG. 3—Curved scraper blade on improved table feeder avoids piling up and uneven loading of materials on belt.

these functions, including bed speed, may be a detriment, rather than an asset, to the sintering process. An even flow of the feed to the machine will minimize bed speed changes.

The pug mill must do a good job of mixing. Location of the outlet relative to the paddle shafts and to design of the exit chute is impor-

tant. Means for eliminating dust and steam are necessary. The mill should feed rather than extrude materials onto the belt going to the swinging spout. Water should be added in several small streams along the mill, rather than in one large stream near the inlet.

The drum type pug mill is not suitable for high filter cake in the mix or for wet sticky ores. With a properly designed swinging spout, Fig. 2, it is possible to have as high as 50 pct of the total mix consist of filter cake. Up to 4 tons of excellent sinter per sq ft of grate area per day may be made using no ore or just enough ore to neutralize excess carbon in flue dust.

Swinging spout and leveling board should be coordinated so materials spread evenly across the bed in a fluffy condition. The bed must be smoothed without compacting and must be evenly and well ignited. Blowholes in the bed should be prevented, vacuum maintained, and leaks at the sealing points of pallets avoided.

Materials and fuel should be fine and evenly mixed. A material with segregated fuel should be avoided where possible. All materials should contain enough evenly distributed moisture to prevent dust in handling. Very fine materials should contain premixed fuel and be handled in the form of 28 to 30 pct moisture filter cake. Some of these very fine materials may be handled in the form of small pellets that are free of dust.

Keep ore particles below $\frac{1}{8}$ in.

Coarse ore slows the sintering process and lowers the quality of the sinter. Ore particles over about $\frac{1}{8}$ in. will not sinter, unless rather high fuel is used. Coarse materials segregate out in the bins. The ore also segregates to the sides of the sinter bed and onto the grates. Too much air will pull through at the sides of the pallets. This has the effect of uneven spreading and may slow production. Strength of the sinter will be lowered and the returns and finished product will contain unsintered ore. No attempt should be made to sinter ore containing over 35 to 40 pct plus $\frac{3}{8}$ in. material as it comes from the mines.

Best sinter can be made from materials 70 pct or more minus 100 mesh and practically all minus $\frac{1}{8}$ in. Fifty pct or more of the mix may be minus 200 mesh material, handled mostly as 28 to 30 pct moisture filter cake containing premixed fuel. With this high proportion of wet filter cake 25 pct or more of very hot return fines must be used.

When filter cake from blast furnace gas washer dust is used in this proportion, up to 4 tons per sq ft of grate area of compact, porous, strong and unglazed sinter can be made. The filter cake, correctly handled, increases the rate of sintering zone travel. But bulk density of the charge is lower when all flue dust is used than when the mix is made up largely from ore.

Minus 325 mesh material makes excellent sin-

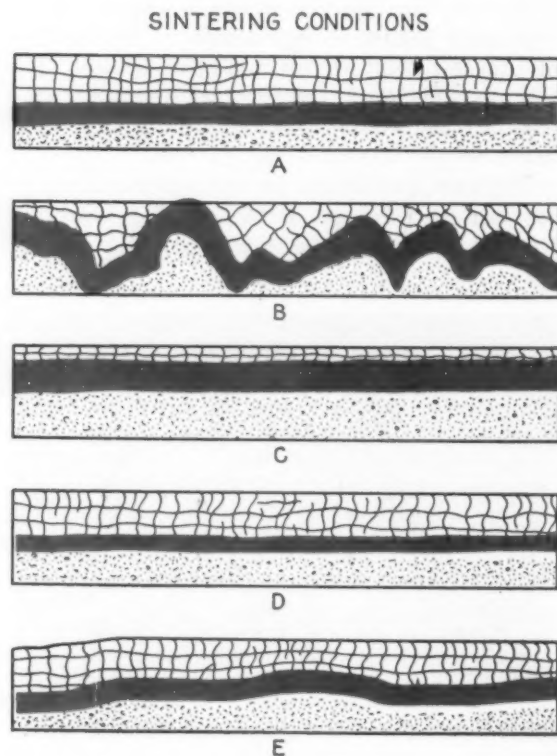


FIG. 4—Sintering conditions: A, ideal; B, poor; C, excess fuel; D, low fuel; E, poor spreading of material.

ter if in the form of high moisture filter cake containing about 4 pct of well mixed carbon. The mix may be made up of 50 pct or more of this material. Substituting this material for the flue dust filter cake would not lower production. Quantity and temperature of returns must be carefully controlled. This can readily be done by using double deck and quick change grizzlies. Returns must be fed by means of a table feeder directly onto the belt that dumps into the pug mill.

Belt speeds should be held down to 150 to 200 fpm. Small belts can be used at the higher speeds, but they cannot be properly scraped, spills increase, and belt slippage increases belt maintenance. Spills increase operating labor and tend to make the plant dusty and dirty.

When belt scrapers and junction boxes are properly designed, and belt speeds kept low, a change in direction of the flow of materials is not serious. Dusty materials, such as sinter returns, should go directly to the pug mill without being transferred from one belt to another. A belt 2 in. wider than the conveyer width is easily trained and helps avoid spillage. A 26 in. belt on a 24 in. conveyer, at 100 fpm easily handles up to 2000 tons of materials in 24 hrs.

Total delays for maintenance, including "repair days," should not be over 2 pct of total operating time. Careful handling of sinter after it is made is important. Crane bucket handling can ruin the best of sinters. For maximum yield and strength, the product should be just sintered through as the pallet leaves the wind box. Where the sinter is to be handled on a rubber belt conveyer, it must be cooled before it is put on the belt.

Top cake is always weak

Because of rapid air cooling sinter on top of the cake will always be comparatively weak. For this reason, a sinter cake turner should be used to get this weak sinter into the returns.

If a rotary type cooler is being used, then, to avoid excessive use of cooling water, sinter must be cooled to about 400° or 500°F on the wind boxes. With a 16 wind box machine, from 4 to 8 wind boxes must be used for cooling. The number required for cooling depends upon the bed depth. Time required for this pre-cooling is independent of bed depth. For a 12-in. bed about 6 wind boxes must be used for cooling. This leaves only 10 wind boxes for sintering and cuts production proportionately. Even with this amount of wind box cooling, some water must be used on the sinter as it leaves the rotary cooler. This rapidly air cooled sinter will not stand crane bucket handling.

All wind boxes may be used for sintering if water cooling, box cooling, is used. The sinter will have greater structural strength than wind box cooled sinter and proportionately more sinter will be produced. Life of grate bars and pallets

will be greatly increased. This sinter should have as little "drop" as possible and should never be crane bucket handled.

For structural strength, slow air cooling is best. Bucket handling should be avoided. Sinter may be bucket handled and still arrive at the furnaces in pretty good shape if made largely from very fine materials.

Even spreading of materials across the bed is controlled by the angle at which the back or leveling board is set. The front of the spout is open so it can be cleaned while in motion. Ladder-scrapers, made up from chains having bars welded to them, keep the sides of the spout clean. A 4 x 4 in. steel billet, suspended where the spout strikes it, aids in cleaning.

An open type ignition burner is low in first cost. Maintenance and fuel costs are low.

Open type furnace is best

The open type ignition furnace, Fig. 1, is made up entirely of pipe and fittings and is superior to the oven type furnace. Even ignition clear across the bed is possible and no overheating or "popping" are experienced. The burner does not need to be warmed up. Ignition is instantaneous because the flame comes in direct contact with the materials. No wind box area is lost under the burner and gas consumption is low.

Stationary side guards make it possible to use simple cast iron pallets. With proper operation breakage can be eliminated and slack and vacuum maintained. For complete maintenance, only about 6 to 8 man hr per pallet per year will be required. If wind box cooling is not used, pallet life is indefinite and slotted grate bars will have an average life of up to 2 yr.

For machines with pallets 6 ft wide, the vacuum fan should be designed to easily handle 9000 cfm of air per wind box at desired vacuum and at about 350°F. Optimum vacuum is about 28 to 30 in. water pressure. Air velocities in the wind line should be kept below 2000 fpm. Individual wind box dampers increase efficiency of

IDEAL SINTERING CONDITIONS

30 pct ore minus $\frac{3}{8}$ in.

30 pct catcher dust

35 pct filter cake at about 30% moisture

5 pct mill scale

Returns—20 pct of total mix

Moisture—10 pct of total mix unless specified

Carbon—3.8 pct of total mix unless specified

Vacuum—22 in. at wind boxes unless specified

Bed—12 in. deep unless specified

Good pugging Full control of returns

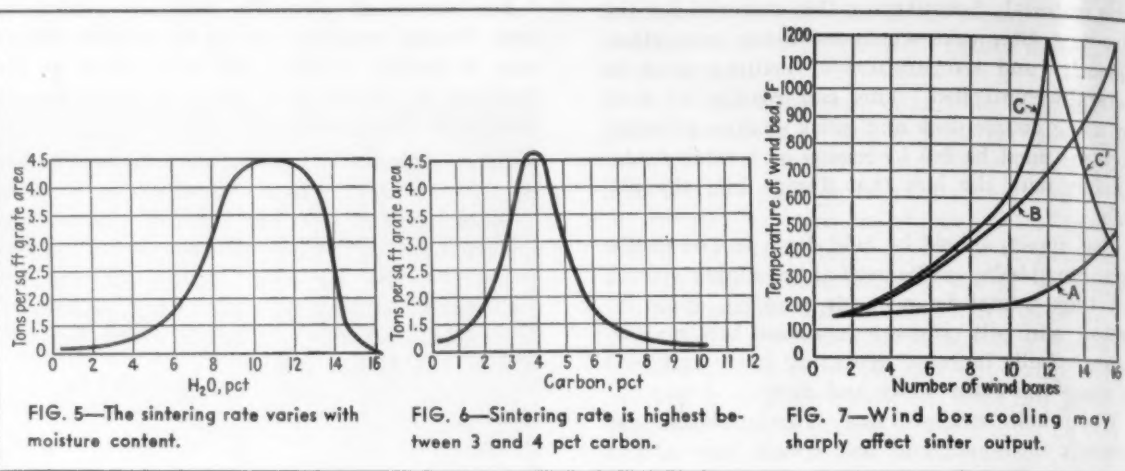
Good operation Parallel operation of feeders

Good maintenance Side delivery swinging spout

Good ignition Open type ignition furnace

Good spreading Carbon minus $\frac{1}{8}$ in., well mixed

These conditions should give a sinter zone travel rate of up to 1.4 in. per minute and $1\frac{1}{4}$ in. is assumed for the cross section shown in Fig. 4A.



the sintering machine while starting and stopping and aid in pallet maintenance.

Table type feeders, Fig. 3, are preferable for all but filter cake. Removable wear plates on top of the feeder table increase table life. A curved scraper blade will cause the material to flow approximately along its natural path and avoid piling up and uneven loading.

A weight plate to support the weight of the material in the storage bin lowers the power needed to start the feeder table. Operating power is cut in half, and life of the reducer under the table increased indefinitely. To maintain desired ratios of materials in the mix, drives for all feeders except that handling sinter returns, should be connected in parallel.

Sinter quality studied

To indicate how varying operating conditions affect sinter quality, sections of the sinter bed of a well designed and maintained 6 wind box machine were analyzed.

Fig. 4 shows the sintering zone, under several conditions. At A, about 7 minutes after ignition, conditions are ideal. The zone would be about 2½ in. deep and even across the bed. Sinter should be compact, porous and unglazed with Fe_2O_3 comparatively high.

Effects of segregated carbon are shown in B of Fig. 4. Principle source of this segregation is in the flue dust but may be due to poor pug-ging, coarse fuel, or mixing the fuel with other materials at the feeders. Weak, honeycombed and glazed sinter would be made. Production would be cut to about ⅓ that possible under ideal conditions. Sinter would be very dusty.

C of Fig. 4 shows the effect of increasing the carbon content to 4 to 4½ pct, with other conditions ideal. The zone will be about 4 in. deep and production will be cut 10 to 20 pct. The sinter would be honeycombed, glazed, brittle and

weak, but would show comparatively low dust when crushed.

Effect of too little carbon, 2½ to 3 pct, is shown in D of Fig. 4. The zone, shown at the end of 7 minutes, would be 1½ to 2 in. deep. The sinter would be compact, porous, unglazed, weak and very dusty. Production would be a little below that in A.

The bed, at E, is not filled at the left showing the effects of poor spreading. It is too high at the center and right. Too much air is pulled through at the left. Too little at the center and right. This causes the zone to be uneven, lowers production and increases dust. This condition can be corrected by adjusting the swinging spout and backboard.

Sintering speed varies with moisture

Fig. 5 shows the effect of moisture on the sintering rate. A dry, fine charge has little porosity and will not ignite. The sintering speed is low until about 6 pct moisture is reached. Then it increases rapidly to about 10 pct and drops very rapidly after about 12 pct is reached. It is practically nil at 16 pct. High moisture may be partially offset by increasing the fuel. Low moisture in the mix is indicated by spreading of the ignition flame. High moisture is indicated by a dull ignition. Low moisture tends to decrease depth of the sintering zone.

Carbon affects the sintering rate as indicated in Fig. 6. With moisture constant, the sintering rate increases very rapidly from 1½ to 3½ pct carbon. It then decreases rapidly to about 6 pct and will be practically zero at 9 or 10 pct. The best sinter will be made with the optimum carbon. The highest Fe_2O_3 should also result because of the high sintering temperature and shallow sintering zone. The effect of high carbon can be partly offset by high moisture content, but sinter quality will be lowered.

The amount of carbon can be judged closely by the appearance of the ignited bed. As little as 5 pct change in the amount of carbon is quite noticeable. Carbon can be closely controlled by recording the temperature near the bed surface just after ignition. Raising the carbon from $3\frac{1}{2}$ to 4 pct will cut production, raise the Fe_3O_4 , cause honeycombing, reduce porosity, glaze the sinter, reduce its density, increase its brittleness, but will cut down dust when the sinter is crushed.

Fig. 7 shows the relation of wind box cooling to sinter production. For maximum production, highest quality sinter and best life for grate bars and pallets, the sintering zone should reach just the grate bars as the pallet is leaving the last wind box. For this condition, the temperature at the wind box will be about 500°F , as shown on curve A. When large percentages of high moisture filter cake are being used, this temperature should be held at about 450°F . This allows some unsintered material to drop into the fines bin where it sinters and increases the temperature of the fines.

Curve B shows the bed sintering through at the next to the last wind box. Curve C shows the bed sintering through at about No. 9 wind box of a 16 wind box machine. Curve C¹ shows the cooling of the sinter necessary, when a rotary cooler is used, to avoid belt burning and water quenching. The high temperature at the last wind boxes rapidly burns up grate bars and pallets and causes a disagreeable temperature condition in the sinter plant.

Water sprays used in summer

During hot weather, it is necessary to spray water into the wind lines in order to keep the temperature down. Grate bar life is longest under condition A, shortest under condition C. It takes 4 to 6 minutes to cool the sinter to a wind box temperature of about 400°F at the last wind box. Increasing the carbon increases the cooling time. Lowering the vacuum increases it. Increasing the bed depth lowers the number of wind boxes needed for cooling.

Anything that lowers porosity increases cooling time and cuts production. Raising the vacuum narrows the sintering zone and increases

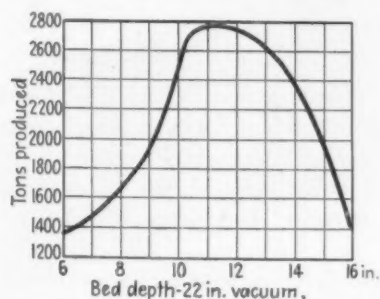


FIG. 8—Maximum output is attained with 10 to 12-in. bed.

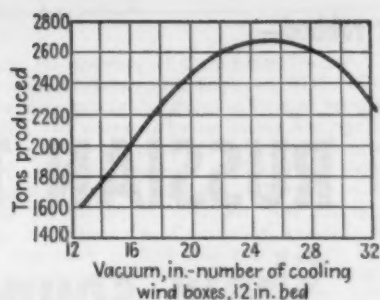


FIG. 9—Bed is constant at 12 in. as vacuum is varied.

the cooling air pulled through the bed. This lowers cooling time. More preheating of air and materials, with the deeper bed, increases production. The lowered wind line temperatures raise the vacuum.

Optimum vacuum as measured at the wind boxes is assumed for each bed depth. Fig. 8 shows the effect of increasing bed depth and holding the vacuum at 22 in. No wind box cooling is used. With a 6 in. bed, too much air is pulled through. This cuts production. When the bed is increased above about 14 in. with the 22 in. vacuum, not enough air is pulled through. This, with the drying out of the materials at the bottom part of the bed, rapidly cuts production.

Sinter made with the shallow bed is somewhat stronger than that made with the deeper bed because a smaller percentage of it is quick air cooled. This is partly offset by the increased proportion of fines at the top of the bed.

Increasing yield is noted where the bed depth is increased while optimum vacuum is maintained for each bed depth. (No wind box cooling is used.) Both the vacuum increase and the bed depth increase tend to increase production. However, above about 14 in. in bed depth drying out of materials starts to cut production.

Higher vacuums increase air velocities. This causes greater erosion of vacuum seals, wind boxes and wind lines. More vacuum is lost due to air leaks. As a result of the quick cooling of the top part of the bed, more fines are made.

Fig. 9 shows the bed being held constant at 12 in. depth while vacuum is increased from 12 to 32 in. at the wind boxes. No wind box cooling is used. At 12 in. vacuum, not enough air is pulled through the bed. After about 24 in. vacuum is reached, too much air is pulled through and production decreased.

The productions shown are for a 16 wind box machine, but are largely based upon results obtained on a 6 wind box machine under regular operating conditions. Results of some tests were also used. Hematite ores were used. The curves are intended to indicate trends, rather than to show actual productions attained. Statements made relative to these percentages are based upon the discussions of Swedish sintering practice—AIMME 1950 proceedings.

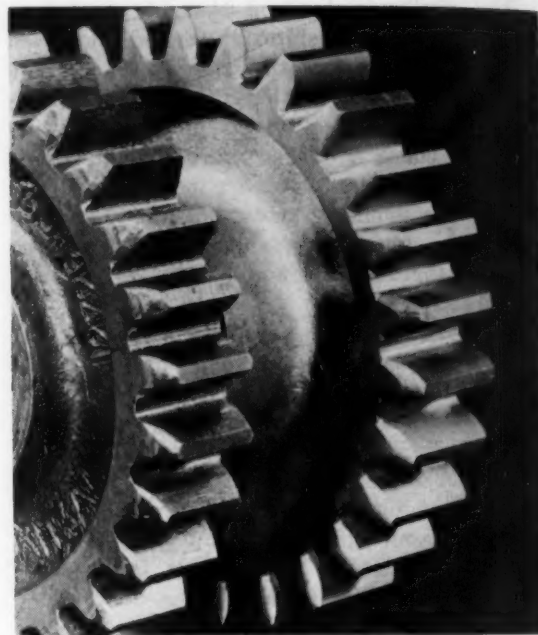
We wuz robbed—

RUSSIAN TRACTORS

Show sound engineering



By W. G. Patton
Asst. Technical Editor



TRANSMISSION GEAR from Russian and Caterpillar tractors shows difference in shop practice. Russian gear, left, appears to have been hand filed at edge of tooth. ➔

Russian Stalinetz 80 tractors captured in Korea are intelligent copies of the 10-yr old Caterpillar D-7. A close study by Caterpillar Tractor Co.'s Research Dept. shows metallurgical practices are comparable to American practice. Nickel and chromium have been substituted for molybdenum, and induction hardening is being used in heat treating. The Russians have done very little redesigning. Greater use of castings is made but internal cleaning of castings is poor. Close machining tolerances are held where necessary. But where surface finish isn't critical, very high speeds and feeds are used in machining.

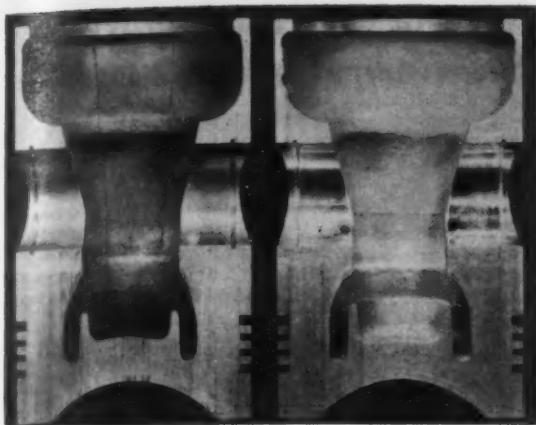
The question is often asked: How good is Russian metalworking practice? A correct answer is apparently: Better than you think.

An analysis of the two Russian Stalinetz 80 tractors by Caterpillar Tractor Co., Research Dept. shows that the Russians have made a remarkably intelligent copy of the Caterpillar D-7 tractor built 10 years ago. The machine has been redesigned to fit Russian standards and

Russian shop practices as well as the Russian materials situation. Dimensions have been changed over to the metric system.

An intimate study of the captured Russian tractors permits these broad conclusions to be drawn:

- (1) Anti-friction bearings appear to be good.
- (2) Metallurgical practices are generally comparable to American practice.



PISTON FROM RUSSIAN Stalinetz 80 tractor is compared with American original, right. Russian castings were poorly cleaned. But Russians used many more castings in tractors.

(3) While surface finishes are often rough, in fuel injection equipment some of the tolerances are even closer than American practice.

(4) The Russians have done very little redesigning: they have simply appropriated about 40 years of tractor design and manufacturing experience at Caterpillar.

(5) Limited investigation shows parts among Russian engines are interchangeable.

(6) The tractors captured showed evidence of poor internal cleaning of castings.

(7) The Russians used nickel and chromium freely, but no molybdenum.

(8) They know about and use practices such as induction hardening.

(9) Where surface finish isn't critical, the Russians use very high feeds and very high speeds in machining operations.

(10) Russians use more castings than U. S. firms.

(11) They are apparently lacking in the high

Through the courtesy of Caterpillar Tractor Co. and the Society of Automotive Engineers, THE IRON AGE is able to report on the status of Russian metalworking practice. This report is based on the findings of engineers and metallurgists of Caterpillar Tractor Co., Peoria, Ill. who recently examined in detail two Russian-built tractors captured in Korea. The Russians copied the Caterpillar D-7 but they did not make cheap imitations. The Caterpillar Research findings were presented to SAE and the Military by J. M. Davies, L. E. Johnson and H. G. Kolb. A complete report will be found in the SAE Journal for June 1952.

quality cutting oils and machining oils we have.

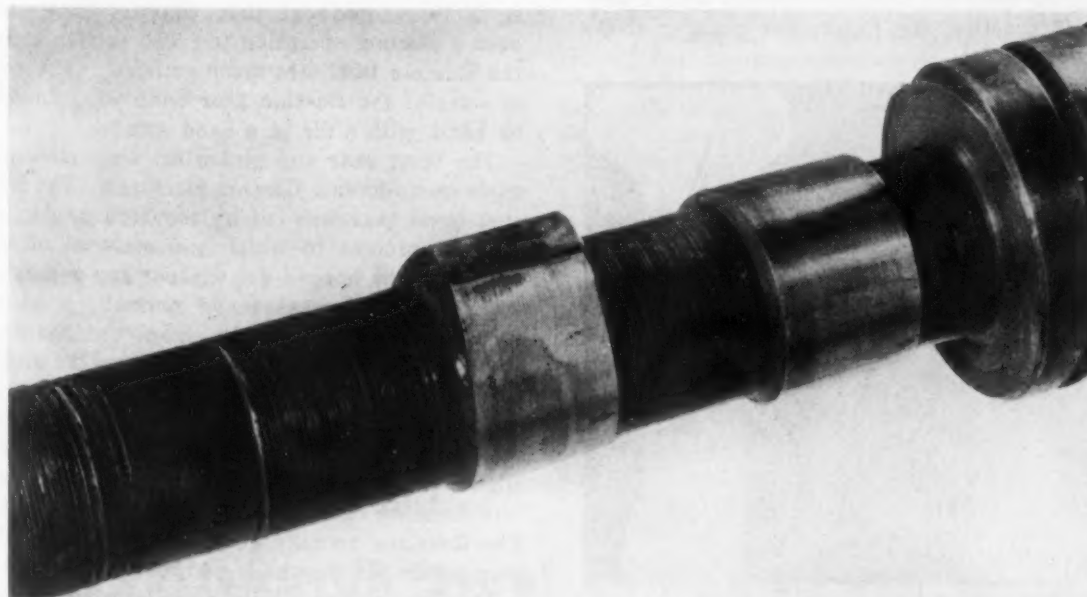
According to J. M. Davies, one of the team of Caterpillar investigators, the metallurgical practices on the Russian-built machines are very good. While the appearance of some of the operations on the Russian bearings would not be acceptable to most American customers, the bearing examined in detail was acceptable for certain types of installation.

Investigator Johnson emphasized there are important differences between the Stalinetz 80 tractor engine parts and the Caterpillar parts as to (1) detail in the finishes, (2) in some of the tolerances and (3) some design practices.

While the Russian machine is generally excellent from the standpoint of design and metallurgy, they have neglected to clean the block as well as they might have. This may result in sand and slag working loose, affecting bearing life. This may be a matter of inspection and followup rather than engineering.

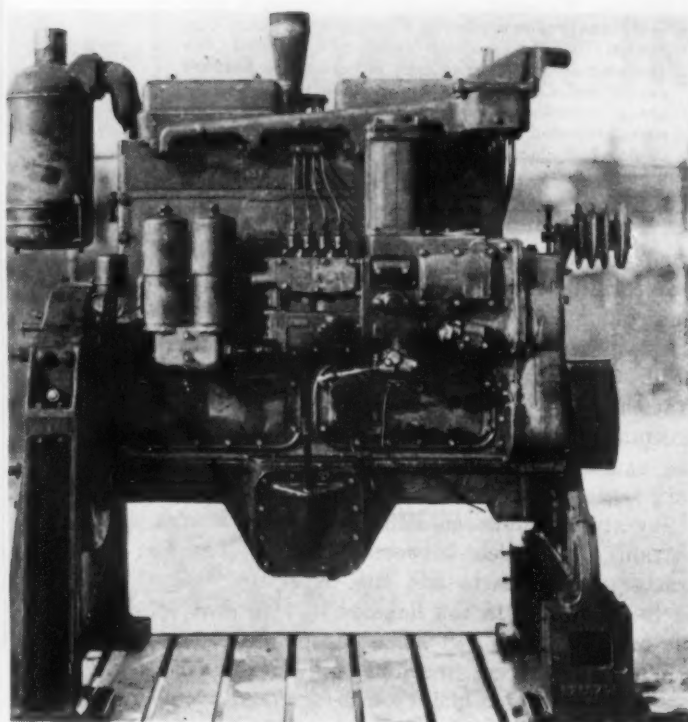
The metallurgy of the Russian idler gear is essentially equivalent to the Caterpillar gear. Hardness is about the same. The Russians have

For explanation of how American machine tools are smuggled into Russia see "Trading: Russian Buyers Slip Underground," The Iron Age, May 22, 1952, p. 73.



CAMSHAFT POINTS up machining methods. Where finish doesn't count Russians use high speeds, feeds. But they can hold close dimensional tolerances where necessary. Serrated portions show especially rough machining.

**"Where good finish was essential, the Russians were able to secure it.
... track links were improperly heat treated ..."**



← MOTOR FROM RUSSIAN Stalinetz 80 tractor, captured in Korea, is part by part copy of 10-year-old Caterpillar D-7. Russians have done little redesigning.

an average difference of about 0.000040 in. between two given diameters of the same part. In the Russian plungers, the difference is only 0.000012 in. There is considerable evidence the Russians have the ability to make close fits.

There were several examples in which Russian flame hardening practice was a little sloppy and didn't hit the part very square.

The Russian piston was cast using a sand core underneath the crater where the oil pocket is located. The sand core was apparently set on top of a 7-piece permanent mold core.

The Russians used induction hardening for their cylinder bore liner. Evidently they did not have chrome-plated piston rings at the time the tractor was built.

They used a few parts such as bolts some of which had center drill holes, indicating their bolts are turned on centers instead of in fixtures. This would be a comparatively slow operation.

In his discussion of the Russian tractors, H. G. Kolb pointed out that whereas Caterpillar used a shaving operation to finish certain gears, the Russian teeth are much rougher. The ends of some of the Russian gear teeth were finished by hand, with a file or a hand grinder.

The bevel gear and pinion set were obviously made on up-to-date Gleason machines. The Russian bevel gear was cut by the high production formate process in which the material of the tooth space is hogged out without any generated action. This process would normally wind up with a straight-sided tooth. However, the Russians have managed a curvature along the profile on their bevel teeth.

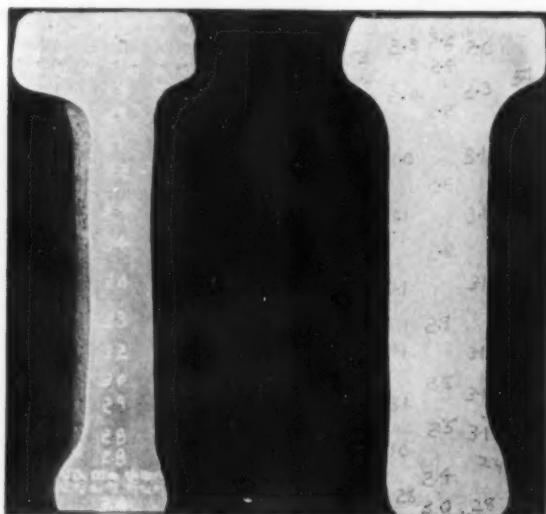
Investigation shows the induction hardened Russian final drive bull gear is becoming soft slightly below the pitch line. The hardness pattern does not extend all the way down the teeth. The Russians actually get a better tooth profile than we do but they have no crown on the teeth.

The Russian track links were improperly heat treated, either because of plant layout or human failure.

used chromium and nickel to give equivalent performance to the Caterpillar Cr-Ni-Mo steels.

In machining the camshaft, the Russians evidently used a gang tool in an effort to speed up production. There was serious deflection of either the tool or the camshaft. However, where good finish was essential, the Russians were able to secure it.

For example, comparing the fuel pump plungers from the Russian tractors with Caterpillar's practice, the Caterpillar plunger shows



HEAT TREATING practice shows up in this comparison of track links. Russian link, left, was improperly heat treated, either because of plant layout or human failure.

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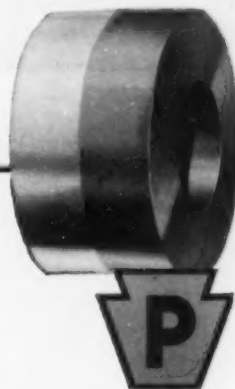
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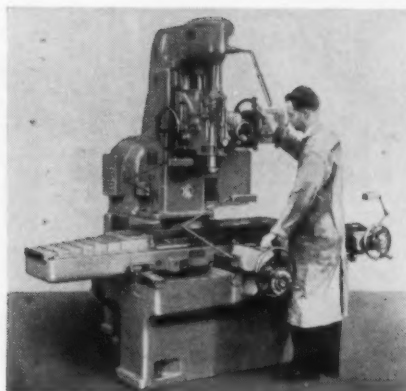
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NEW equipment

New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 155 or 156.

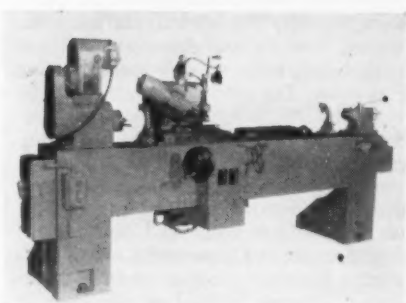


Electrolimit measuring system on jig borer

New small-size jig borer provides an accurate machine for precision locating, drilling and high-speed boring in small work. Design improvements include: heavier and wider bed construction, table and carriage way telescoping guards, built-in electrolimit measuring system, new design quill mounting and a handy control center for faster and easier operation. Table settings accurate to 0.0002 in. are

made quickly with the new measuring system. Two measuring units, independent of traversing screws, control the longitudinal and transverse setting. The spindle quill mounting is designed to maintain its initial rigidity and accuracy for the life of the machine. A 12x24 in. table has 18 in. longitudinal travel and 12 in. transverse travel. *Pratt & Whitney.*

For more data circle No. 18 on postcard, p. 155.



Machine sharpens round and flat broaches

On a new universal type broach sharpening machine for round and flat broaches, the variable drive headstock, intermediate steady rests, and live center tail stock are mounted on a stationary machine bed. Fixed machine bed offers two advantages: broach is held securely in a rigid position with no chance

for misalignment; less floor space is required for the machine. Adjustments for sharpening are made with the grinding wheel spindle, which is mounted on a traversing carriage and equipped with micrometer adjustment. *American Broach & Machine Co.*

For more data circle No. 19 on postcard, p. 155.

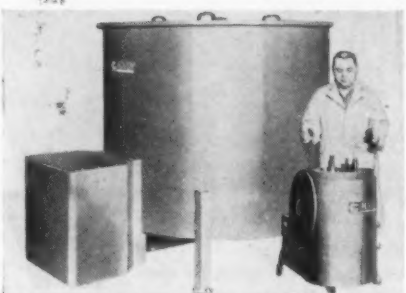


Swiss lathe adapted to American requirements

In adapting the original George Fischer copying lathe to the requirements of American production, New Britain engineers have preserved the accuracy and versatility of the original product. The machine is a new approach to contour turning and internal copying. Location of the template on the

front of the machine facilitates changeover or adjustment, and places template in full view of operator. Hydraulic system is enclosed in carriage. Light contact pressure of the tracer permits use of templates cut out of thin unhardened steel. *New Britain Machine Co.*

For more data circle No. 20 on postcard, p. 155.



Swirling turbulence cleans parts quickly

Strong whirlpool-like agitation of cold cleaning solvents loosens and removes dirt, oil, grease and chips from parts placed in the new Wirl Agitor cleaning units. Parts are placed inside the heavy gage steel tank, in a basket or heavy steel rack. Solvent is swirled in a

powerful vortex, in, on and around the parts, cleaning them automatically. Electric motor drives the V-belt and the large-vaned impeller for the turbulent action of the solvent. Capacity is 5 to 330 gal. *Graymills Corp.*

For more data circle No. 21 on postcard, p. 155.

Turn Page

THE IRON AGE

Behind The

**J&L
STEEL**

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photograph by d'Arazien

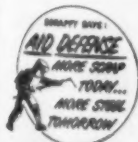
STEELMEN are Canning Fruits and Juices in the Never-ending Search for Better Steel

"Putting up" prunes and fruit juices may seem like an odd occupation for steel technicians. But, at one of J&L's laboratories, where tin plate for food containers is evaluated, canning is one of the many test procedures.

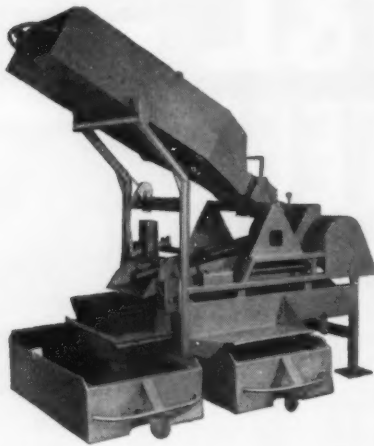
The food is packed in cans made from selected lots of J&L tin plate, thin steel coated with tin, sealed, and cooked at sterilizing temperature. The cans of food are placed in a controlled temperature storage room, where the heat accelerates any action that may be reducing the vacuum within the can.

By measuring the vacuum loss, as it occurs, technicians can estimate what the life of the test cans would be under normal storage. This knowledge helps in controlling the quality of tin plate to make sure canned foods on your grocer's shelf continue to have long storage life.

Quality control guides every step in the production of J&L tin plate and other steel products. It combines with research—another of the activities that go on behind the J&L trademark—to assure better steel for every application.



JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

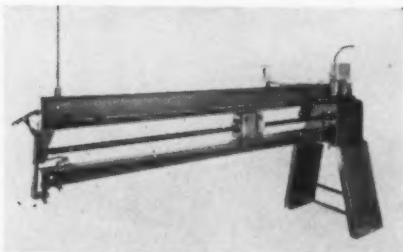


Machine separates parts from finishing chips

New separator removes parts from deburring and finishing chips and grades the different sizes of chips. Greater compactness is attained by locating the hopper at the top of the machine, cutting required floor space by one-half. Separation of parts is effected without danger to the parts. Two deck carriage permits grading three sizes of chips at one time. The inclined end of the screen carriage is motivated by an eccentric; the lower end rests

on ball bearing rollers. Eccentric action of the screen is blended into a smooth backward and forward motion at the point of separation of the parts from the chips. By the simple turn of a cam, which raises the lower end of the carriage off its rollers, the machine is converted to chip grading. Of all welded steel construction, separator is powered by $\frac{3}{4}$ hp variable speed drive. *Grav-i-Flo Corp.*

For more data circle No. 22 on postcard, p. 155.

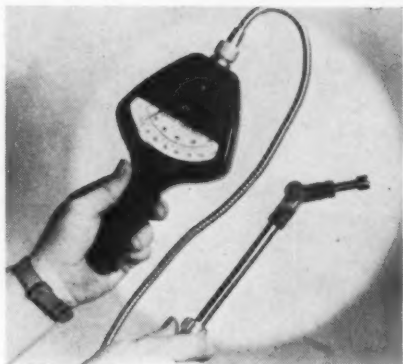


Seams any thickness of sheet metal, 30 to 18 gage

A sheet metal joiner, made to automatically seam sheet metal, can, in 40 sec, exerting 11,000 psi, permanently seam two sheets of metal. Working from pressure derived from force that the roller assembly exerts against an overhead struc-

tural steel beam, the joiner travels in one direction, automatically reverses direction for a second and final operation which smooths the seam. *Standard Power Groove Machine Corp.*

For more data circle No. 23 on postcard, p. 155.

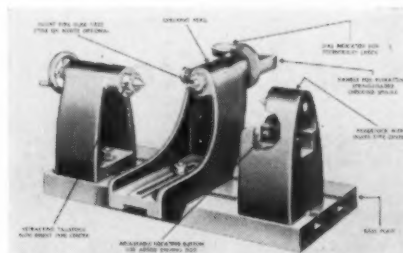


Hand pyrometer has two scale ranges

Rapid and convenient measurement of surface, liquid, gas and molten metals temperatures is possible with a new hand pyrometer having two scale ranges. Three interchangeable tips available for the FH-1, include a surface tip, an immersion tip for liquids and molten metals, and a two-pronged contact tip. These tips, together with flexible and rigid extension

arms, can be easily changed. Automatic cold-junction compensation feature eliminates need for manual adjustment of the pointer for variations in temperature of the instrument or its surrounding atmosphere. Scale ranges are 0-500°F and 0-1500°F. Flick of a switch makes change from one scale to other. *General Electric Co.*

For more data circle No. 24 on postcard, p. 155.

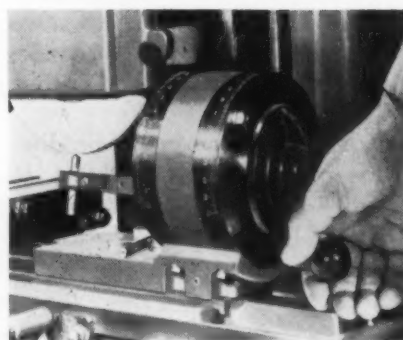


Stock divider lessens gear grinder downtime

For setting up a gear preparatory to grinding, a new stock divider checks eccentricity of the gear and locates high point on the pitch circle, for properly mounting on its arbor. Machine operator can clamp each gear on its arbor while an-

other gear is being ground, eliminating unproductive machine time. The stock divider may also be used for checking eccentricity and tooth size of finished gears. *National Broach & Machine Co.*

For more data circle No. 25 on postcard, p. 155.



Radius-tangent-angle wheel truing simplified

Wheel truing attachment forms with one continuous movement of the diamond, accurate radii on grinding wheels with accurate tangents at either or both sides of the radii. Convex radii up to $\frac{1}{2}$ in. with tangents to $\frac{5}{8}$ in. long at any angle, from 90° above horizontal to 20° below, can be formed. Concave radii from $\frac{5}{32}$ to 1 in. (with

diamond tool furnished) having tangents up to $\frac{5}{8}$ in. long at any angle, from 90° below horizontal to 20° above, can also be formed. Angles of the tangents are independent of each other. Attachment clamps to machine table by single T bolt. *Brown & Sharpe Mfg. Co.*

For more data circle No. 26 on postcard, p. 155.

Turn Page

"Here's why I keep a stock of Kaocast on hand!"

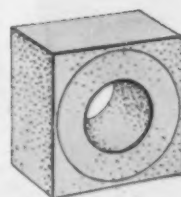


The Chief Engineer of a mid-western power plant finds B&W Kaocast so *versatile* that he always keeps a ton or more on hand for miscellaneous jobs. This is only one of hundreds of plants in a list of diversified industries which are discovering practical, time-and-money-saving uses for this unique 3000 degree refractory castable. The panel at right gives a few examples.

There are good reasons for these Kaocast "success stories". This jack-of-all-refractories can be molded in a hurry *by you*, when you need it. It can be cast directly in place or applied by cement gun. Kaocast not only makes possible faster repairs and eliminates the need for a large inventory of special shapes, but it also stays on the job. That's because Kaocast has high resistance to spalling and slag attack, low volume change and negligible re-heat shrinkage.

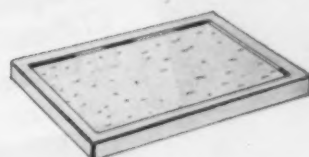
Get all the data on easy-to-use, versatile Kaocast from your B&W Field Engineer. His specialized experience is an important B&W "extra".

KAOCAST is another important refractories development by B&W engineers who have continuously established new standards in industrial furnace refractories for the past 30 years.



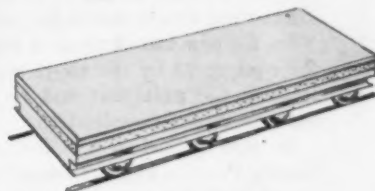
BURNER BLOCKS

Kaocast lasted 3 to 6 times as long as previous refractory. Still going strong.



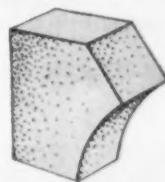
DOOR LININGS

Kaocast lasted 3 to 6 times as long as previous refractory — cut installation cost in half.



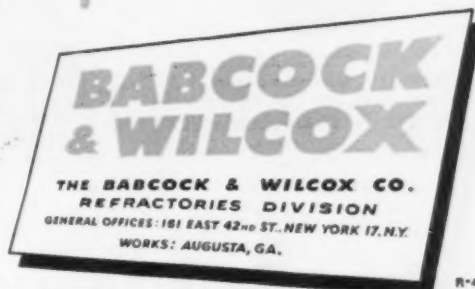
TUNNEL KILN CAR TOPS

Ordinary fireclay crumbled after few trips. Kaocast lasted 30 trips without deterioration.



SPECIAL SHAPES

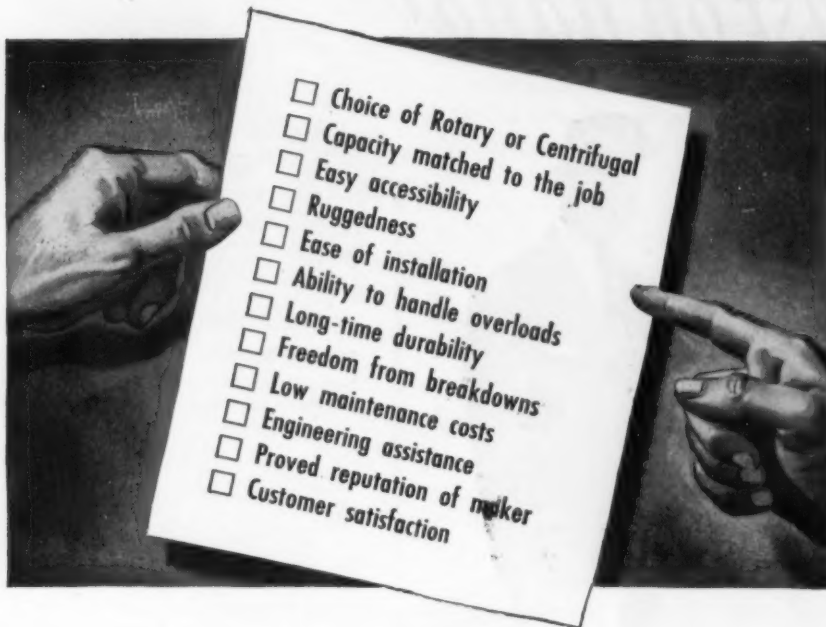
Kaocast special shapes cast over weekend to meet production demands.



R-407

B&W REFRACTORIES PRODUCTS — B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick
B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment . . .
Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

BEFORE BUYING *any* BLOWER COMPARE THESE ESSENTIALS



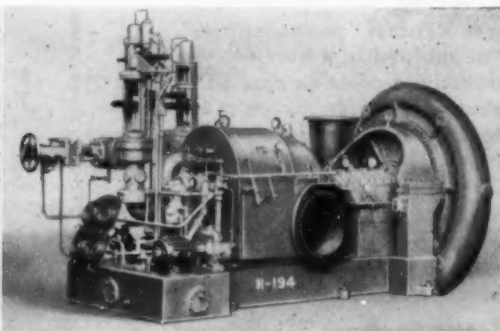
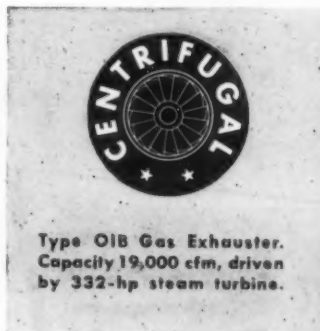
When production depends so vitally on adequate handling of gas or air, you can't afford to take chances on the performance of your blowers or exhausters. It's better to be safe than sorry.

So, for new installations or replacements, we suggest that you evaluate the equipment by the above standards of comparison. This will help determine the unit that will be most effective, economical and reliable for your specific applications.

Be sure to include the R-C dual-ability line of both Centrifugal and Rotary Positive types. Remember, that only we offer you this dual choice—with unbiased recommendations from almost a century of experience. With capacities from 10 cfm to 100,000 cfm or higher at moderate pressures, R-C equipment has a long record of outstanding performance in industrial applications.

We'll gladly send detailed information for comparison—or supply engineering help if we can be of service.

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Continued

Forging furnace

New Forgeatrol furnace can heat high-speed and alloy chisels for both forging and hardening, and provide true cold shank heating. Its principle confines heat to the chisel point, prevents loss of temper in the shank during tool redressing. Shank breakage is said to be virtually eliminated in tool use. Forgeatrol furnaces provide fast, uniform heating controllable between 1200 and 2800°F. *Delaware Tool Steel Corp.*

For more data circle No. 27 on postcard, p. 155.

Waterproof tape

Polyken No. 329, an industrial pressure sensitive tape, reputedly meets Government Specifications as the almost perfect moisture vapor barrier. It has excellent tack, adhesion, tensile strength, and is available in O.D., black, red and all other Gov't Spec colors. *Bauer & Black, Div. Kendall Co.*

For more data circle No. 28 on postcard, p. 155.

Mask washing machine

Dangers and health hazards attendant to the washing of spray painting masks are eliminated with an automatic mask washer. It uses only 50 gal of solvent, while 40 non-clogging nozzles direct a powerful spray against both sides of the mask. Twenty to 25 wet coats of lacquer can usually be removed in 20 sec., using acetone. Other solvents can be used. *Conforming Matrix Corp.*

For more data circle No. 29 on postcard, p. 155.

Winch brake

A new governing brake for use with electric or gasoline winches operates on a centrifugal governing principle. It delivers a smooth, gradual retarding action at any desired interval within a range of 900 to 4000 rpm and automatically checks the speed of a free-falling or free running load. It is primarily designed for shaft mounting. *St. Anthony Machine Products Co.*

For more data circle No. 30 on postcard, p. 155.

Open-mesh sandcloth

Gritcloth, a new sanding fabric, is a tough open-mesh fabric that holds abrasive firmly, but lets removed stock flow through the holes. Either side of Gritcloth may be used wet or dry, flat or folded, on sanding machines or by hand, and it is easily cleaned by rinsing in water. Available in finer grits suitable for smoothing surfaces on wood or metal. **Bay State Abrasive Products Co.**

For more data circle No. 31 on postcard, p. 155.

Centrifugal pumps

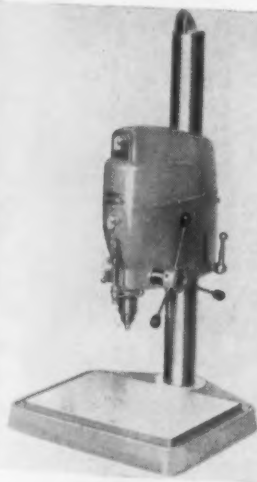
Redesigned horizontal, multi-stage centrifugal pumps for medium-pressure applications, incorporate modern hydraulics that give higher efficiency and better operation. Called the Class CNTA, these pumps are intended for boiler-feed, mine dewatering, marine, refinery and general industrial services to 800 lb. Built in 1½, 2, 2½ and 3-in. sizes, units are available with 4, 6 or 8 stages. **Ingersoll-Rand Co.**

For more data circle No. 32 on postcard, p. 155.

Precision drill

Designed for fast setup in tool-room, model shop, maintenance and production use, the new Electro-Mechano 16-in. precision drilling machine has wide range variable speed from 150 to 4000 rpm; built-in back gears and standard ½ hp motor for single or three phase operation. It has completely enclosed design; quick-set positive depth stop. **Electro Mechano Co.**

For more data circle No. 33 on postcard, p. 155.



Turn Page



THE experienced baseball player knows how to "slide safe" on a "hot steal"!

Don't take chances on a metal stamping source when you have so much at stake! The development of your component parts or products represents an important investment and your final step . . . proper fabrication by Worcester Stamped Metal . . . is *one sure way to be safe!*

Sixty-nine years experience in the metal stamping industry really counts, too! With this background, Worcester Stamped Metal assures perfect "teamwork" . . . from designing to mass production of uniform, precision component parts.

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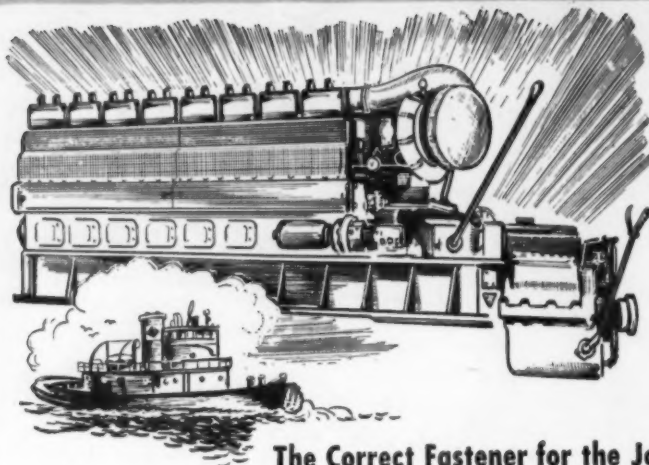
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New Equipment

Continued

Cup grinding wheel

Tough resin-abrasive shell 3/16 in. thick built around rapid-cutting core enables a new cup grinding wheel to retain a sharp cutting edge throughout service life. It is particularly suitable for grinding hard-to-reach corners and complicated shapes. *U. S. Rubber Co.*
For more data circle No. 34 on postcard, p. 155.

Finishing room tanks

Laminated Fiberglas tanks for finishing room operations are highly resistant to chemical attack inside and outside. They are non-conductive and can withstand freezing as well as boiling temperatures. Laminex tanks have a smooth white interior that will not discolor. They can be equipped with dam overflows and drains. *MacDermid, Inc.*
For more data circle No. 35 on postcard, p. 155.

Embossing presses

A line of four knuckle joint embossing presses have pressure of 100, 250, 650 and 1000 tons respectively. The lighter models are built with a one-piece cast steel frame, the heavier model has a built-up frame with four hot shrunk-in steel tie bars. Presses are equipped with multi-disk friction clutch and brake, hydro-pneumatic clamping and electro-pneumatic control. They have controlled ejectors in slide and bed. *Transmares Corp.*
For more data circle No. 36 on postcard, p. 155.



Oil spray

Metal Guard, a rust-preventative and lubricating oil spray, packaged in a 12-oz aerosol spray container can be sprayed into hard-to-get-at areas such as assembled components and interior mechanisms. When applied to chrome-plated automobile bumpers, trim, etc., it serves as a chrome-preservative. Its water-displacing characteristics allow the oil to get underneath water or wetness on the metal surface, leaving a continuous film of oil directly on the metal. *Mitchell Chemical Co., Inc.*

For more data circle No. 37 on postcard, p. 155.

Lighter truck engine

Truck-engineered and truck-built, a new high-compression GMC engine has a compression ratio of 7.2:1 and generates 145 gross brake horsepower at 3600 rpm. Weighing only 545 lb (dry), the 302-cu in. engine is reportedly 500 lb lighter than other engines of comparable power. The engine will be placed in the GMC 450 and 470 (2½ and 3 ton) model series trucks and tractors. *GMC Truck & Coach Div.*

For more data circle No. 38 on postcard, p. 155.

Plastic mallets

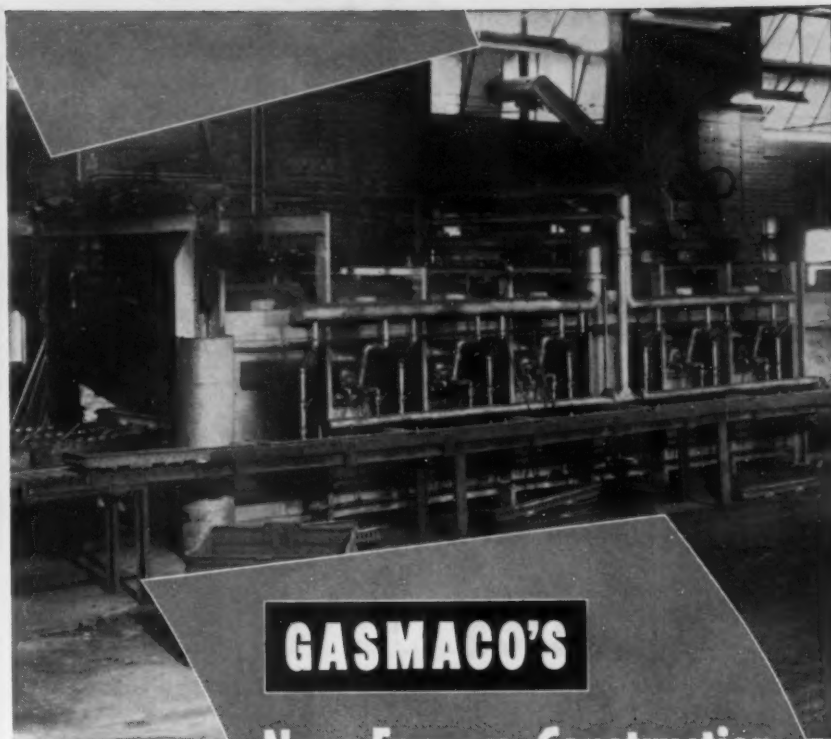
Soft plastic mallets in seven models have head weights of 1 to 14 oz, head diameters between ¾ and 2 in., and head lengths 2¾ and 4 in. Head can be refaced with a file or grinding wheel when they become distorted or damaged. Faces can be shaped to meet special requirements. *Matticks Mfg. Co.*

For more data circle No. 39 on postcard, p. 155.

Gas welding flux

New flux is applicable to aluminum and stainless steel, and said to be equally effective as a paste or as a powder. Features claimed for it are: Does not break down or flake off; does spread thinly and evenly ahead of flame; cleans oxides ahead of puddle; floats any remaining impurities smoothly out of puddle; protects aluminum or stainless on each side of weld area; and cleans easily. *All-State Welding Alloys Co.*

For more data circle No. 40 on postcard, p. 155.
Turn Page



GASMACO'S

New Furnace Construction

ELIMINATES USE OF CRITICAL MATERIALS

Desirable savings in nickel and other critical materials can be accomplished through new methods in design and construction of industrial furnaces by The Gas Machinery Company.

Specifications for forging and heat treating can be met by employment of a rotary furnace, the construction of which requires only refractory and moderate quantities of carbon steel. Rotary furnaces require less investment for the same duty, and results are superior.

Other Gasmaco accomplishments include the use of silicon carbide in roller hearth furnaces, replacing alloy steel. For practically all applications where alloy steel tubes and rollers were formerly used, silicon carbide can be substituted, with greater benefit.

Our furnace engineers will be glad to point out the many advantages of Gasmaco developments and industrial heat applications which may fit your requirements.

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by **KIRK AND BLUM**

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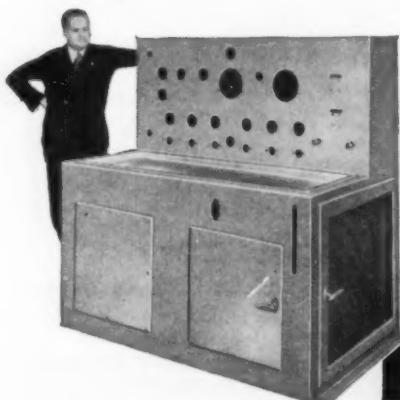
Whatever your requirements in sheet, plate and alloy fabrication, Kirk & Blum can produce for you . . . economically and quickly.

Complete facilities through $\frac{3}{8}$ " capacity for square and rotary shearing, braking, forming, rolling, punching, riveting, welding, grinding, drilling and finishing sheets and light plates and structurals.



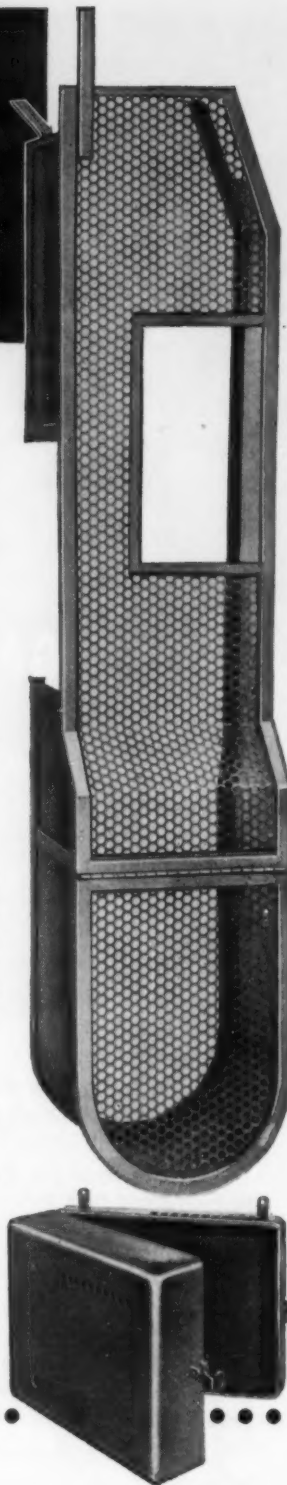
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Stampings • Pans • Louvre Panels • Cabinets

KIRK AND BLUM
METAL FABRICATION



New Equipment

Continued

Industrial fan

Rugged industrial fan built with either an air handling, a materials handling, or a long shavings wheel is made in 11 sizes with capacities ranging from 670 to 44,000 cfm and pressures up to 16 in. water gage. Accessories include bolted and quick opening type access doors, flanged outlets and inlets, and outlet dampers. *Westinghouse Electric Corp.*

For more data circle No. 41 on postcard, p. 155.

Corrosion preventive

New hydrocarbon chemical, called Mabros, prevents corrosion on ferrous, nonferrous and any other type of surfaces. Rust should be removed, then Mabros can be applied to the clean surface, either alone or mixed with any diluent such as grease, oil, polish, wax or any other product intended for a protective coating. It is applied by immersion, sprayed or painted on. *Phillips Scientific Laboratories.*

For more data circle No. 42 on postcard, p. 155.

New bucket tooth

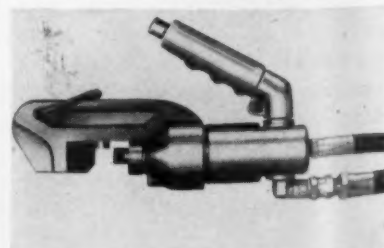
New cutter for clamshell buckets consists of a base that is permanently attached to the scoop, or lip, in the usual manner, and a reversible and renewable tip that fits into a slot and wedges itself into the base. The unit is replaced in a fraction of time required to install old style teeth. *Blaw-Knox Co.*

For more data circle No. 43 on postcard, p. 155.

Pushbutton cutting

New guillotine clips $\frac{1}{2}$ in. high carbon steel rod with press of button. Complete cutting cycle takes $\frac{1}{4}$ sec. Unit exerts 20 tons thrust from portable high-speed hydraulic pump, 2 hp 220/440 three-phase motor connected to 25 ft hydraulic hose. Blades are easily removable for sharpening. *Manco Mfg. Co.*

For more data circle No. 44 on postcard, p. 155.



Copper-saving rod

Kaptrade resistance welding electrode is now available in No. 3 Morse taper sizes. This is an expendable cap type electrode which fits into a semi-permanent adapter shank, which in turn fits any standard electrode holder of No. 3 Morse taper size. Electrodes are made in six nose styles. *Weiger Weed & Co.*

For more data circle No. 45 on postcard, p. 155.

Wood screw

Twinfast wood screws having two threads with twice the pitch are said to drive twice as fast as conventional wood screws, hold tighter, yet cost the same. The screw has parallel sides, is not tapered, and therefore has more thread area in contact with the material to give greater holding power. Sharp, single point makes possible a self-centered start for straight driving. Flat, round and oval head styles are slotted or cross-recessed. *Townsend Co.*

For more data circle No. 46 on postcard, p. 155.

Better finishes

Production tolerances of ± 0.00025 in. are consistently common with the Little Shaver. The Jemco tool will fit the standard circular form tool holder or the back slide on a B&S automatic screw machine and with slight modification, it can be used on other automatic screw machines, hand screw machines and turret lathes. Two models, standard and special, are available in three sizes, 00, 0 and 2. *Jersey Mfg. Co.*

For more data circle No. 47 on postcard, p. 155.

Small magnetic chucks

Three new small electromagnetic chucks provide advantages of magnetic chucking for smaller machine tools and for bench work. They facilitate holding workpieces for hand sawing, scraping, layout, filing, drilling, and grinding. Chucks measure 5x10 in., 6x12 in. and 6x18 in.; are precision built of all steel construction and operate on ac voltage. *Hanchett Magna-Lock Corp.*

For more data circle No. 48 on postcard, p. 155.

Turn Page



...*Presteel is PROGRESSIVE!*

PRESTEEL is a leader of research in metals and in the development of metal craftsmanship — is actively associated with such groups as Pressed Metal Institute, American Society for Metals, American Society of Tool Engineers, American Society of Mechanical Engineers, National Association of Manufacturers, Associated Industries of Massachusetts—and many other technical and industrial organizations.

At Presteel, we are small enough to assure personal attention — to maintain friendly relations with our plant and with the public, yet we are large enough to develop an aggregation of top talent, who have built an outstanding company reputation for dependable results.

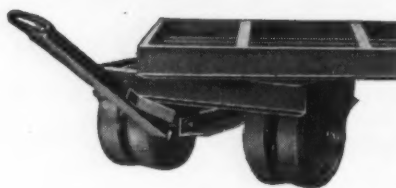
These endeavors perpetuate the efforts and ideals of Presteel's founders . . . that the organization may become of greater service to you — as a part of American industry.

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Built with 80 years of skill by pioneers in the industry. Over a hundred standard two, four, and fifth wheel trucks and trailers. Special units designed and built to your specification. Complete engineering service.

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New Equipment

Continued

Purifier cleans steam

Dirt, moisture, riser discharge and solids are removed before passing on to the distribution piping when a new internal downflow purifier is installed in an auxiliary tank above evaporators, packed towers, deodorizers, inside steam drums, etc. They increase heating efficiency and protect pipeline equipment in steam application. In chemical and petroleum vessels they recover valuable vapors. They increase production in evaporator operation. Constant separating efficiency is reportedly maintained even as velocities become greater. *V. D. Anderson Co.*

For more data circle No. 49 on postcard, p. 155.

Ball valve

New 1/4-in. ball valve is recommended for working pressures up to 3000 psi. Tight, positive shut-off is provided by a stainless steel ball that closes into a machined, conical seat. Alignment of ball to seat is accurately piloted by a forged steel, union-type bonnet, fitting tightly to the body and assuring correct valve closure. Packing of preformed, graphited asbestos with a plastic binder can be replaced without shutting off the line pressure or interrupting the process. Straight through and angle types are available with two to four connections. *Foxboro Co.*

For more data circle No. 50 on postcard, p. 155.

Contact wheel

New-type contact wheel has spare rubber tires that cut wheel replacement costs. With the new wheel it is necessary only to replace the rubber tire, which can be done in a few minutes. The wheel comprises a balanced T-54 rubber tire vulcanized on a steel frame, or rim, for rigidity and support. The two sides of a split universal hub machined from aluminum are joined together by four Allen screws, locking the tire in place. Tires are available in standard face widths of 1 to 6 in.; durometers range from 10 to 90 in plain surfaces or slot designs. *Chicago Rubber Co.*

For more data circle No. 51 on postcard, p. 155.

ATLANTA, Ga., Alpine 4885
Morrison-Drabner Steel Co., Inc.

BALTIMORE, Md., Peabody 7300
Hill-Chase Steel Company of Maryland

Asheboro, N.C., Phone 8849
Richmond, Va.: Phone 7-4573

BEAUMONT, Tex., Phone 4-2641
Standard Brass & Mfg. Co.

CHICAGO METROPOLITAN AREA
Korhmel Steel & Aluminum Company
Evanston, Ill.: Ambassador 2-6700

CINCINNATI, Ohio, Wabash 4480, 4481
Morrison-Drabner Steel Co., Inc.

CLEVELAND, Ohio
Nottingham Steel Company
Atlantic 1-5100
Copper & Brass Sales, Inc.
Endicott 1-6757

DALLAS, Tex.
Delta Metals, Inc.
Hunter 7446
Earle M. Jorgensen Co.
Riverside 1761

DAVENPORT, Iowa, Phone 3-1895
Nichols Wire & Aluminum Co.

DETROIT, Mich.
Cauhorn Distributing Company
Texas 4-7000
Copper & Brass Sales, Inc.
Lorain 7-3380

HONOLULU, T. H., Phone 5-2541
Permanente Cement Co.

HOUSTON, Tex.
Standard Brass & Mfg. Co.
Preston 1123
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Orchard 1621

INDIANAPOLIS, Ind.
F. H. Langsenkamp Company
Riley 9311
Korhmel Steel & Aluminum Company
Franklin 5361

KANSAS CITY, Mo., Victor 1041
Industrial Metals, Inc.

LOS ANGELES, Calif.
Eureka Metal Supply Company
Mutual 7286
Earle M. Jorgensen Co.
Lucas 0281
Reliance Steel Company
Adams 6133

MILWAUKEE, Wis., Evergreen 4-6000
Korhmel Steel & Aluminum Corp.
of Wisconsin

MINNEAPOLIS, Minn.,
Korhmel Steel & Aluminum Company
Gladstone 5943, Prior 4030

NEW ORLEANS, La.
Orleans Steel Products Co., Inc.
Raymond 2116
Standard Brass & Mfg. Co.
Aud. 1353

NEW YORK METROPOLITAN AREA
A. R. Purdy Co., Inc.
Lyndhurst: Rutherford 2-8100
New York: Chelsea 3-4455
Newark: Humboldt 2-5566

OAKLAND, Calif.
Gilmore Steel & Supply Company
Glencourt 1-1680
Earle M. Jorgensen Co.
Higate 4-2030

OMAHA, Nebr., Atlantic 1830
Gate City Steel Works

ORLANDO, Fla., Phone 7124
Profile Supply Company

PHILADELPHIA, Penna., Delaware 6-5400
Hill-Chase & Company, Inc.
Allentown: Allentown 28077
York: York 5790

PHOENIX, Ariz., Phone 8-5331
Arizona Hardware Co., Inc.

PITTSBURGH, Penna., Hemlock 1-5803
Follansbee Metal Warehouses

PORT ARTHUR, Tex., Phone 5-9377
Standard Brass & Mfg. Co.

PORTLAND, Ore., Tuxedo 5201
Eagle Metals Inc. of Oregon

SAN FRANCISCO, Calif., Klondike 2-0511
Gilmore Steel & Supply Company

SEATTLE, Wash., Lander 9974
Eagle Metals Company

SHREVEPORT, La., Phone 2-9483
Standard Brass & Mfg. Co.

SPOKANE, Wash., Madison 2419
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WHEN you consider the many services your nearby Kaiser Aluminum Distributor offers you, it's clear why he's a good man to have around, whether the aluminum market is tight or soft.

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He studies new methods to help you stretch available aluminum supplies; fur-

nishes experimental quantities; meets emergency needs.

He keeps abreast of ever-changing government requirements—often can supply the information necessary to help you obtain government orders and the aluminum to fill them.

And because Kaiser Aluminum is building facilities which will increase its production of primary aluminum 137%, your Kaiser Aluminum Distributor may, sooner than you think, be able to increase your share.

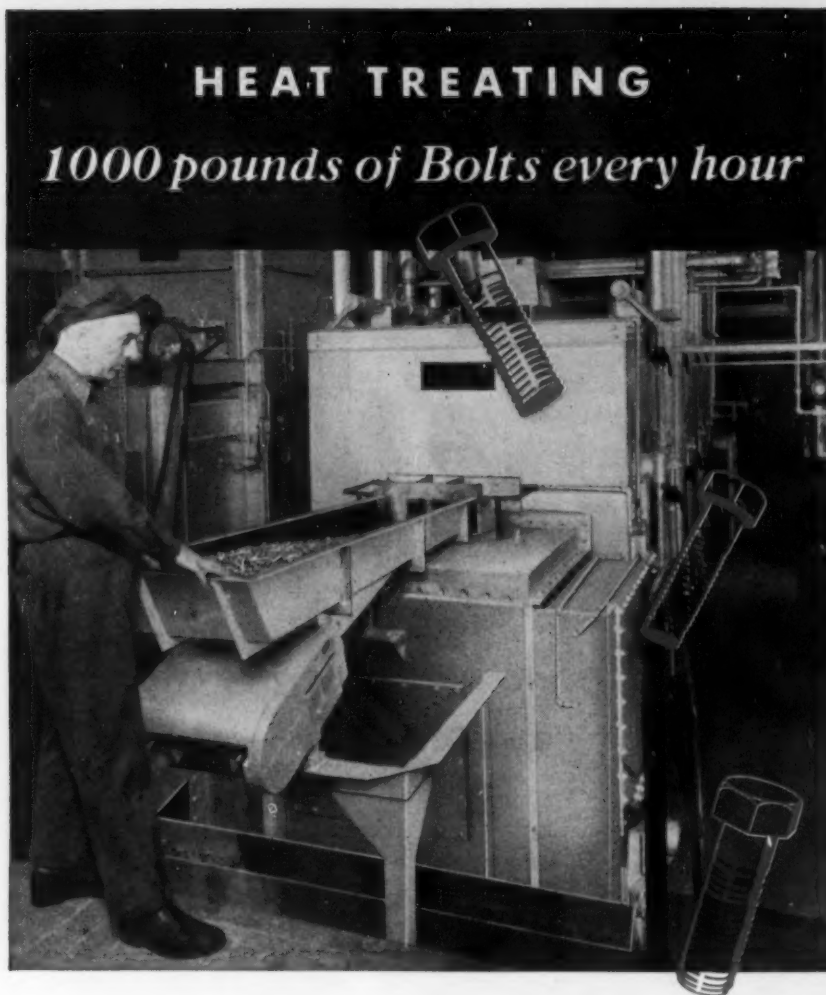
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Kaiser Aluminum

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June 5, 1952



HEAT TREATING

1000 pounds of Bolts every hour

... at Commercial Steel Treating Corp., Detroit

Production heat treating of bolts—1000 pounds each hour—at Commercial Steel Treating Corp., Detroit, is accomplished in this Holcroft furnace which clean hardens, case hardens or restores carbon.

All operation, except for loading is fully automatic. Bolts are loaded into a vibrator and carried through the furnace on an endless belt conveyor. The stock is carried from the quench, across to the washer and tempering furnace, returning to a position near the loading vibrator. Furnace atmosphere is provided by a Holcroft endothermic gas generator.

Gas-fired radiant tubes—easily replaceable without furnace shut down—heats the hardening furnace. Also included in the arrangement is a Holcroft direct-fired, recirculating type conveyor furnace for tempering as high as 1200 deg. F.

This is just another example of Holcroft's heat treat leadership. We can supply you, too, with a high-capacity, low-cost furnace—designed with your production in mind. Write today.

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Holcroft AND COMPANY

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—Technical Briefs—

Materials Handling:

Flow of products and materials speeded with varied equipment.

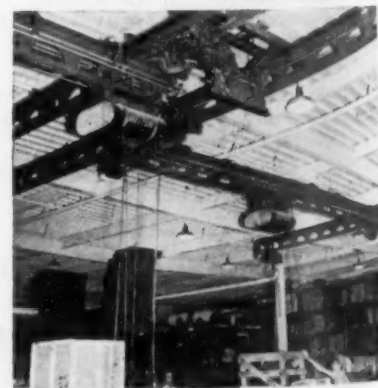
Wide use of cranes, conveyers and other materials handling equipment at the Ivanhoe Road Plant of Reliance Electric & Engineering Co., has cut handling costs while speeding production within the plant.

Equipment includes 83 bridge cranes of 1 to 20 tons capacity; 175 jib cranes from ¼ to 2-ton capacity; 22 two-ton platform-type and fork-type "walk-along" trucks, plus a number of gasoline-powered high-lift fork trucks.

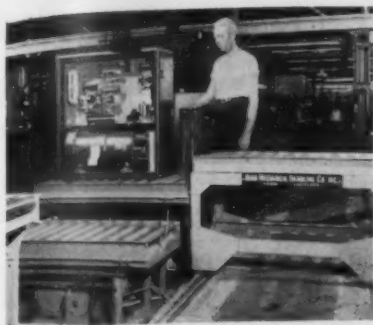
Heavy Work—Due to the heavy nature of the work in process, a large percentage of machine tools and other production machinery is served by individual jib cranes. These areas in many instances also have bridge cranes at their disposal.

A 60-ft overhead monorail system, with transfer bridge connection to twelve 15-ft branches, serves varnish dipping and baking operations. Motor frames, stators and armatures are hung on roller-type trolleys, from which they can be shunted to various dip tanks and bake ovens by switching arrangements.

Entire sections of monorail are suspended on hoists over the varnish tanks and can be lowered to facilitate immersion of parts. Monorail tracks also run into the



CROSSOVER between crane runways in Ivanhoe Div. of Reliance Electric & Engineering Co. makes possible interchange of hoists between bays.



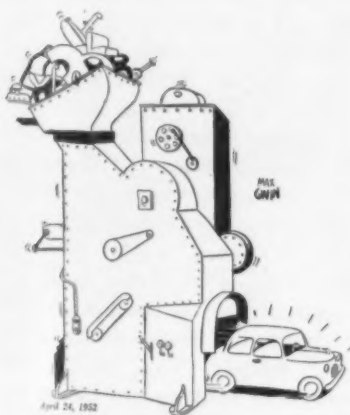
ROLLER CONVEYERS at different levels simplify handling of large electrical and mechanical equipment at Reliance Electric's plant. Heavy units are easily handled.

walk-in ovens, where parts remain suspended from trolley hooks during the baking process.

Through Ovens—Two gas-fired and two electric-type ovens are installed on the first floor. Also, there are two gas ovens on the second floor of the plant for baking windings and impregnating coils prior to assembly. These units are served by two 80-ft monorail lines.

Liberal use is made of roller conveyers in the Commutator Department, enabling the work pieces to be handled from initial assembly steps through machining and baking operations. In this instance, there are four dual-door ovens, each 4 x 4 x 5 ft, mounted directly in the line of conveyor travel.

Shelves inside of each oven are also equipped with roller conveyers, so that work enters the oven through one door and leaves through a second after baking, the entire sequence being conveyORIZED.



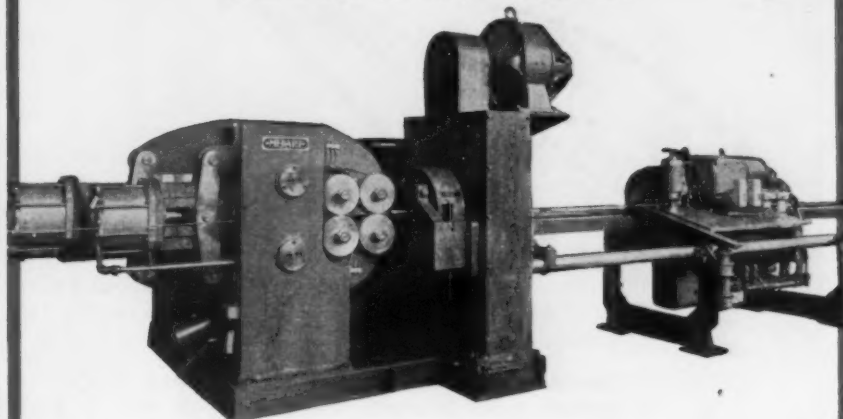
Turn to Page 174

Triple Production or Better on Bar & Tube Turning!

MEDART

RFPD AUTOMATIC CENTERLESS BAR TURNERS

FOR BARS $\frac{1}{4}$ " to 6" DIAMETER



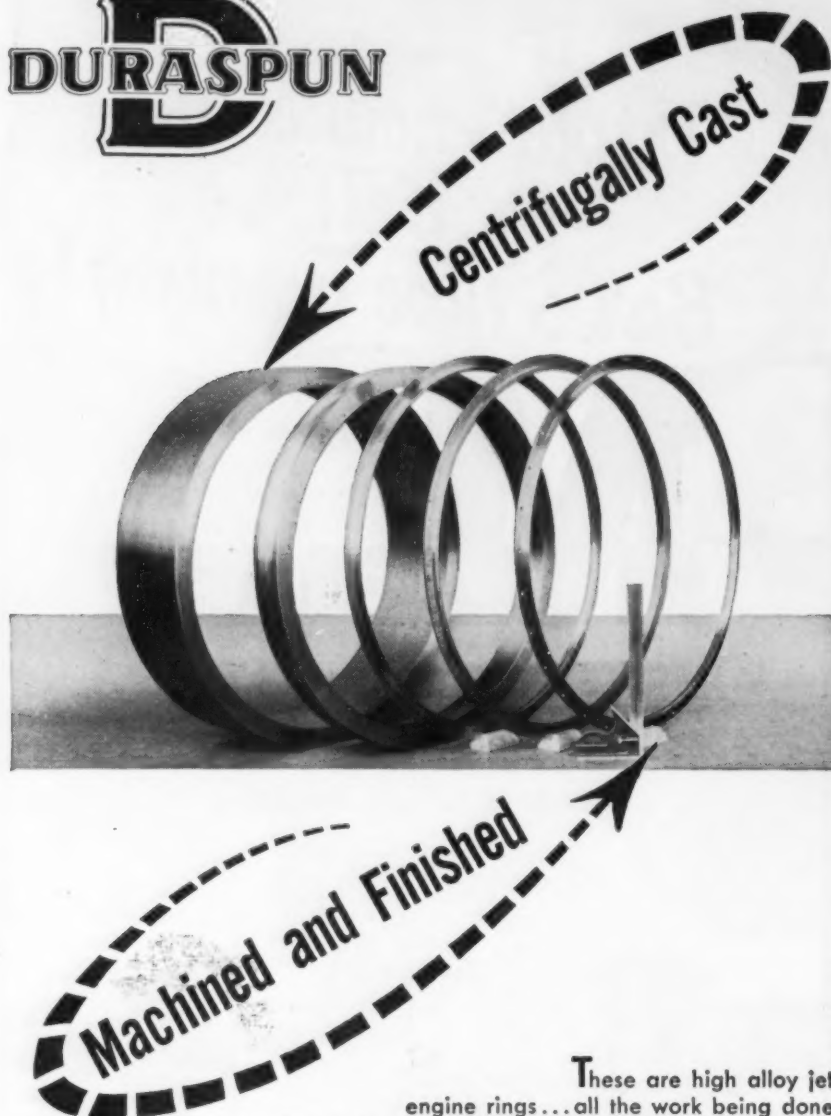
- ▶ The unsurpassed production speeds of the RFPD Turner using carbide cutting tools—up to 12 ft. per minute—average from 3 to 4 times that of conventional turners by actual comparison.
- ▶ Material turned on this machine can be sold directly from the machine for "as turned" stock, put through the Medart two-roll rotary straightening, sizing and polishing machines for "turned and polished" stock, or given one pass through a centerless grinder for "ground" stock.
- ▶ The RFPD turning gives 100% material recovery with short, easy-to-handle chips.
- ▶ Direct-drive cutterhead, through single V-belt drive, is a single compact unit designed for either brazed tip or mechanically held carbide tools.
- ▶ Controls provide fully automatic push-button operation through entire cycle, and supplementary manual operation for setup. Both speeds and feeds are infinitely variable.

Many other cost-reducing, time-saving exclusives are offered in the RFPD Centerless Bar Turner.

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DURASPUN



These are high alloy jet engine rings... all the work being done in our shop, starting with the centrifugal casting right through to the finished ring.

Centrifugally cast metal gives an exceptionally fine, dense, uniform grain structure. The strength of the metal approaches that imparted to a bar or ingot when it is hot forged. It produces an ideal metal for the tough service required of jet engine parts.

Incidentally, as evidence of our knowledge of and experience with tough alloy castings — static as well as centrifugal — the records show very few rejections by this engine manufacturer who subjected each of the many rings we furnished to his own very rigid tests.

May we suggest that you let Duraloy work on your high alloy castings — chrome iron, chrome nickel or nickel chrome? We have the experience and facilities for turning out high quality castings.

THE DURALOY COMPANY

Office and Plant: Scottsdale, Pa. • Eastern Office: 12 East 41st Street, New York 17, N.Y.
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 Metal & Supply Co. 332 S. Michigan Avenue 1241 Taylor Street
 METAL GOODS CORP. Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

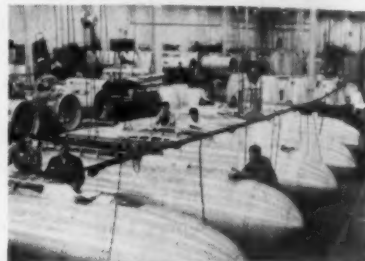
— Technical Briefs —

Fuel Tanks:

External fuel tanks push out range of big B-47B bombers.

Combat range of the new Boeing B-47B bomber has been pushed out to a new perimeter through installation of huge new streamlined tanks. Suspended one under each wing, between tip and inboard jet engine pods, the tanks enable the big bombers to complete long-range missions carrying more than 20,000 lb of bombs.

The huge streamlined tanks, ca-



BIG FUEL TANKS for 6-jet Boeing B-47B bomber are mass produced at Ryan Aeronautical Co. Tanks, electric resistance welded, compare in size to 4-place Navion fuselage, effectively spread plane range.

capacity of which remains secret, are under construction in mass quantities at Ryan Aeronautical Co., which has shipped hundreds to Boeing's Wichita, Kan., plant, where the bomber is in large scale production.

Refueling — Another Stratojet feature extending its flight range is the mid-air refueling system. Being built by Ryan are aft fuselage sections and refueling pods for the Boeing KC-97 strato-tanker. An operator stationed in the pod controls a "flying boom" through which fuel flows in mid-air from the strato-tanker to the B-47B.

Another contribution to the effectiveness of the B-47B are high-temperature components for the new series General Electric J-47 engines, which develop more than 5800 pounds of thrust each, compared with 5200 pounds of thrust for engines used on the earlier B-47 models. Tail pipes which carry the searing jet gases from the engine to the atmosphere also are being built at Ryan.

Preferred Numbers:

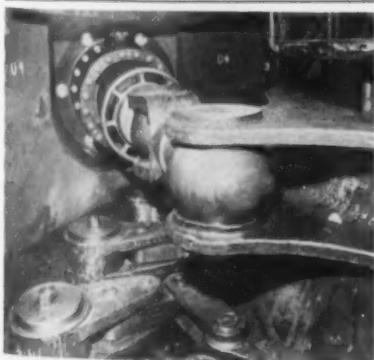
Application to mechanical products to be considered at meeting.

A guide for application of the "preferred numbers" system to length dimensions of mechanical products will be the focal topic of the International Organization for Standardization meeting in New York, June 9-10. Technical experts from 20 countries will discuss the preferred numbers proposal originally submitted by the French national standards organization.

Application of the system to lengths of mechanical products would establish standardized percentage length increases for items marketed in a range of sizes.

Uniform Stepup—An example of the use of preferred numbers is the case of a manufacturer who wishes to produce five machines with ratings between 10 and 100 hp. Using preferred numbers, the rating series would be 10, 16, 25, 40, 63 and 100 hp which gives a uniform stepup of about 60 pct.

Under a random-selected series, the percentage of increase between one model and the next fluctuates widely. If a manufacturer arbitrarily chose a series of 10, 20, 30, 50, 75 and 100 hp, the step-ups differ greatly. In the 10-20 step there is a 100 pct increase, while between 70 and 100 the increase is only 33 pct.

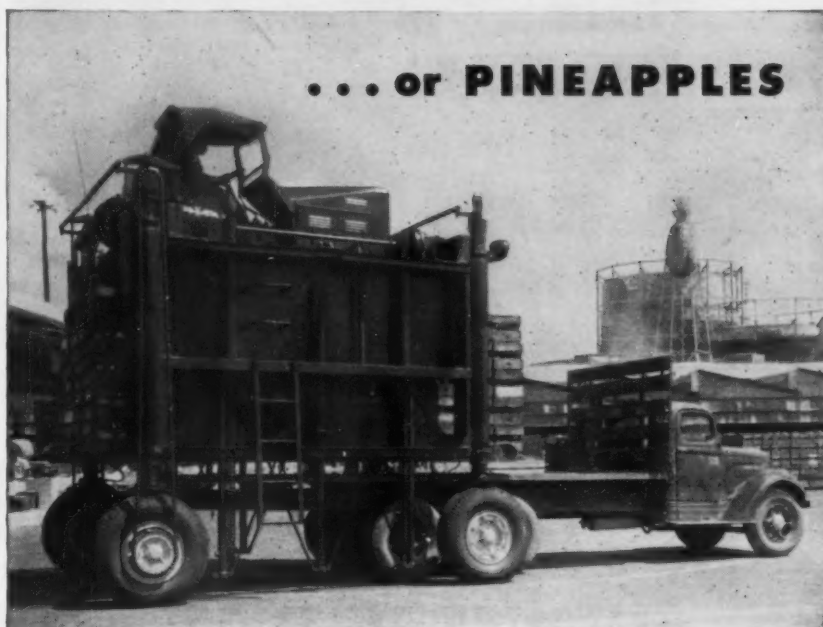


FLOATING DEBRIS won't jam the gates of a hydraulic turbine using this safety release pin. Located at end of gate arm, as above, pin holds the solid link rigid so it acts as an extension of the gate arm. If gate becomes obstructed, pin shears and solid link swings back and forth on the end pin without exerting force on the gate. Safety attachment is made by Baldwin-Lima-Hamilton Corp.
Turn to Page 176

Maybe your business isn't LUMBER...



... or PINEAPPLES



BUT... just imagine the savings you could make, the problems you could solve by handling your materials with ROSS Straddle Carriers, the most flexible and most adaptable mass material handling method known!

ROSS engineers will be glad to work with your materials handling men in exploring the possibilities of ROSS Straddle Carriers for your operations... there's no obligation.

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new ^{*}Snap-on INDUSTRIAL CATALOG

In this comprehensive catalog is the complete line of Snap-on sockets and wrenches for industrial production. To users of power driven nut runners and impact wrenches, this book offers an instant answer to every socket need... every type, every size. Included is a wide range of Snap-on hand tools for assembly operations and plant maintenance. This edition obsoletes any previous issue that may be in your files. Write for your copy today.

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* Snap-on is the trademark of Snap-on Tools Corporation



Technical Briefs

Safety:

Steel Founders' Society fosters safety practice with contest.

Continuing improvement in steel foundry safety practices is anticipated as the direct outgrowth of the 1952 national safety contest being sponsored by Steel Founders' Society of America.

Open to more than 150 member steel foundries, the competition will be conducted during June, July and August, a period during which accident frequency rates tend to be high.

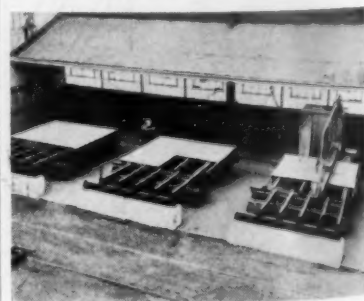
American Standards Assn. will be used to determine lost-time injury rates. Awards will be based on statistical results of monthly reports filed with the Society. Frequency rates developed from the reports will provide the basis on which contest winners will be determined.

For the Competition—Foundries will be divided into four groups based on the number of man-hours of exposure per month, based on reports for the 1951 contest period. Minimum monthly man-hours of exposure, however, must be equal to 50 pct of average man-hours of exposure during the first 5 months of 1952.

Powder Cutting:

Oxy-acetylene powder cutting setup triples billet cutting output.

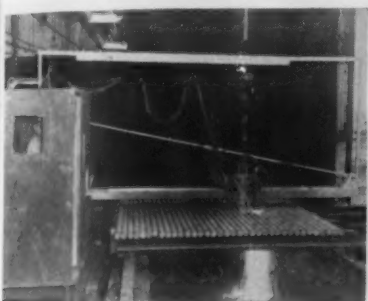
When a hot saw at a billet mill could not keep up with mill production, an oxy-acetylene powder cutting setup was installed to cut double-length billets in half. This billet cutting installation now



CUTTING MACHINE cuts through 3-in. billets at 15 in. per minute. Three stands are used for cutting, loading and unloading.

makes an average of 900 to 1000 cuts per turn—better than three times the production formerly obtained.

The powder cutting device which cuts through steel like a knife through butter is set up at the Timken Roller Bearing Co. plant at Wooster, Ohio. Billets, which average 3 in. in diam, are



POWDER-CUTTING installation for cutting billets enables mill to keep up with production in seamless mills by operating only one turn per day.

shipped to Wooster double length. After cutting they are run through the seam tube mill.

The installation, Fig. 1, consists of three beds, and a carriage cab which mounts the equipment. While billets are being cut on one bed, the second is unloaded, and the third, loaded. As one bed is cut, the carriage moves to another bed ready for cutting.

Runs on Tracks—Carriage cab and cutting equipment run on tracks alongside the billet beds. An Oxweld cutting machine travels on a 10 in. machined I-beam fastened to the cab. The machine cuts through the billets at 15 in. per minute.

An iron-rich powder is used in the oxy-acetylene flame to get quick starts. The operator, in the cab, controls the cutting operation. When the cuts on one bed have been completed, a clutch on the cutting machine returns to starting position.

Four men make up the billet cutting crew: the operator, two chain men, who load and unload beds; and a crane operator. With full crew working, production has gone as high as 1500 cuts per turn.

Turn to Page 178



Specific Purpose Grinding Wheels

Electro's special composition wheels for the specific purpose of grinding any particular metal have repeatedly shown savings on abrasive cost at both vitrified and resin speeds, plus labor savings.

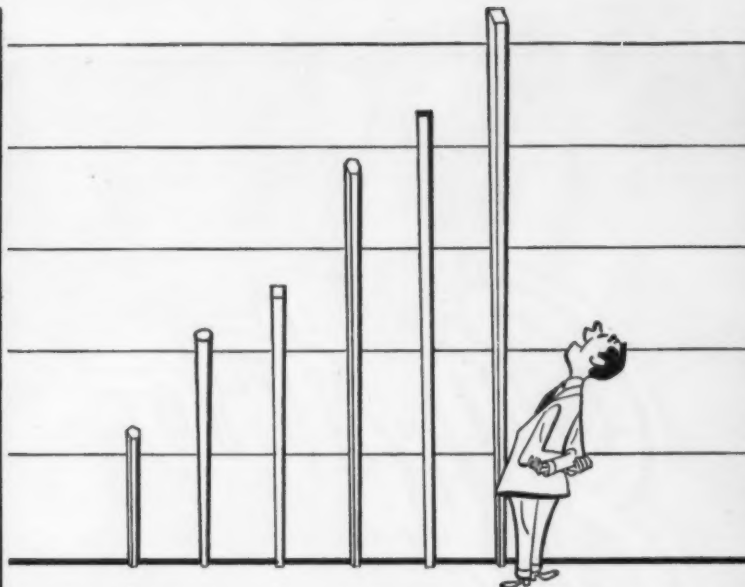
Requirements in grinding wheels become increasingly individual. If the wheel you need isn't made, we'll make it for you. Write, wire or phone for an Electro Sales Engineer to survey your needs without obligation; and send for Grinding Wheel Manual 645 and Speed Calculator. Both free and very useful.



Electro Refractories & Abrasives Corporation

344 Delaware Avenue, Buffalo 2, N. Y.

WEST COAST WAREHOUSE: LOS ANGELES 58. PLANTS IN BUFFALO, N. Y. AND P. Q., CANADA



things are looking up!

Yes, steel supplies are improving tonnage-wise! Even alloy steels are in better supply. However, the continued scarcity of many alloying materials makes certain grades of alloy steel still unobtainable, and substitute grades must be used.

Chances are, we can supply your needs . . . but if we can't, perhaps we can suggest and supply the substitutes best suited for your particular requirements.

Or possibly we can suggest alternative methods of manufacture, or variations in your present methods of treatment.

Your nearest W-L office will be delighted to be of service. Call them today!

Get in the SCRAP! ...every pound means more steel for you!

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.



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LOVEJOY
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Technical Briefs

Simple Device Empties Carts

A simple welded frame and an air cylinder have been designed to do the job of dumping waste carts without using an expensive loading ramp. Installed at Burroughs Adding Machine Co., Detroit, the device is simple to install and operate.



IN-PLANT HANDLING of wastes is simplified with novel dumping fixture built of Burroughs Adding Machine Co., Detroit. Fixture eliminates expensive platform.

A sleeve is welded on each side of the usual paper or sawdust waste cart. A welded structure has been erected on the plant floor. Two arms of this welded structure slip into the sleeves of the cart which is guided into place into the stable-like entry.

A double-acting air cylinder acts on a cable which passes over a pulley and is so attached as to upend the cart when the cylinder stroke is down. On the return stroke, the cart is returned gently to the floor.



"Well, he passed the mechanical aptitude tests—"

Welding:

Stove manufacturer cuts welding rejects on reservoir tanks.

A Southern stove manufacturer, faced with welding rejects on reservoir tanks as high as 35 pct, cut rejects to less than 5 pct through use of improved welding methods.

The water tanks, for use with coal or wood stoves, were constructed of 18 gage steel formed in two sections and welded together. Most tanks were rejected for leaks in the weld area. Welding was done with conventional rods using standard equipment.

Gaps Cause Leakage — Wide gaps occasionally encountered were difficult to fill in and leakage resulted. On the thin gage metal there was also danger of warpage, embrittlement, undercutting, and burn-through because of the high heat of the arc.

A new welding technique, and use of SteelTectic electrodes, made



WATER RESERVOIR tanks for use in coal and wood stoves are tack welded. Complete welding follows. Change in method eliminated leakages, cut rejects from a high of over 30 pct to less than 5 pct.

by Eutectic Welding Alloys Corp., for high-strength welds on light gage steel at very low amperages were tried.

A jig was made to hold the parts in position while being tack-welded, and mounted on a table by means of a swivel bolt. Finally, standard welding equipment op-

Turn to Page 180

THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: $\frac{1}{2}$ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISC RINGS

**BACKLASH
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WEAR and
CROSS-PULL**
are eliminated
LUBRICATION IS
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THE THOMAS PRINCIPLE GUARANTEES
PERFECT BALANCE UNDER ALL
CONDITIONS OF MISALIGNMENT.

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NO MAINTENANCE PROBLEMS.

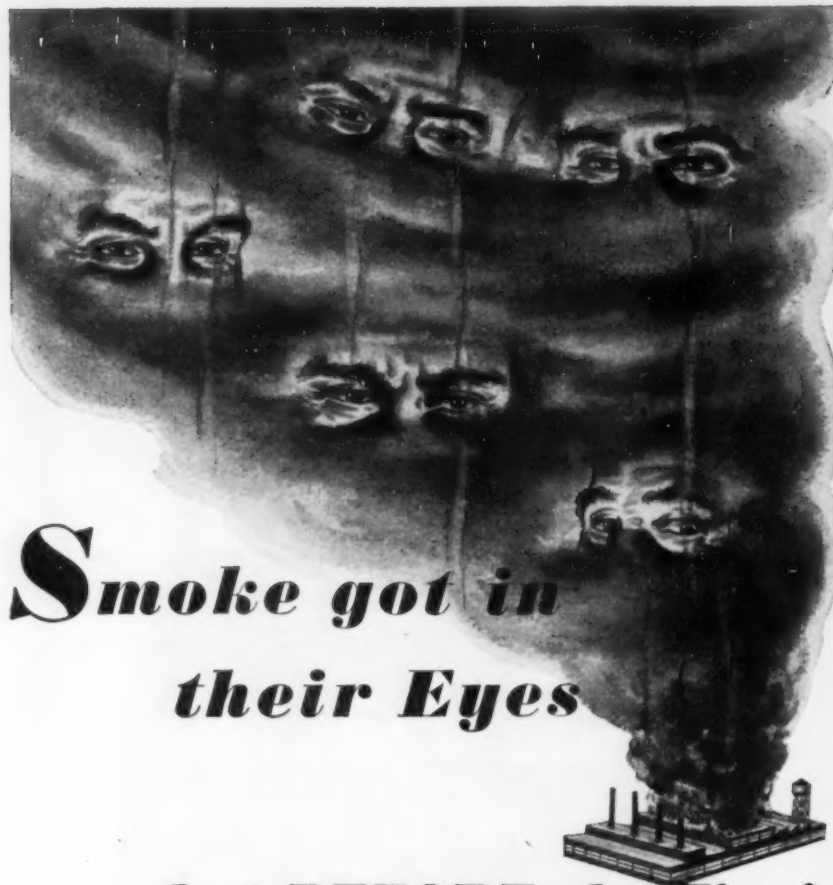
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ALL PARTS ARE
SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA



Smoke got in their Eyes

... but **BEFORE** the Fire!

Yes, the Men in Authority couldn't see the need—the vital need—for the *right* kind of fire protection. And fire struck, as always, when least expected—devastating fire that destroyed irreplaceable records, costly machines, buildings and supplies which will take months—months of no production—to build and replace.

Statistics prove that too many fires result from failure to be ready for them—particularly at key operation points where fire can hit like lightning, crippling operations—dealing a death blow to production!

Are your operations safe? A survey by Cardox will show you how CARDOX "Low Pressure Carbon Dioxide Systems"* can protect the danger spots in your plants against fire—eliminate fire extinguishment losses entirely. A few lines on your letterhead will bring full, eye-opening information.

*Covered by Patents Issued and Pending

CARDOX
ORIGINATOR OF **Low Pressure CO₂**
FIRE EXTINGUISHING SYSTEMS

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Offices in Principal Cities

—Technical Briefs—

erating on AC at 25-35 amp was used. Beads were applied with a 3/32-in. electrode.

Applied Over Welds—Once the tanks have been tack welded it is no longer necessary to remove unwanted slag because beads could be applied right over previous welds without interference, and yet without leaving slag inclusion or porosity throughout the entire weld, especially useful in the tack-welding operation. All welds were applied vertical-down. Rejections dropped from a high of 30 pct to lower than 5 pct.

On tack-welding the amperage was set at 25-35, but when the operator had accustomed himself to the new technique it was possible to increase the amperage for more rapid welding.

Versatility of the electrode is the result of the fluid coating. The flux becomes disintegrated through the arc to give a gaseous atmosphere which permits a deposit of metal free from oxides. Metal is deposited in the form of a fine spray.

Quick Repair:

Stainless steel sprayed on Monel tugboat shaft for low cost repair.

The worn shaft of a New York tugboat was repaired and back in service in 2 days in a recent un-



FAST REPAIR of Monel tugboat shaft was made by spraying stainless steel on worn spots and machining to original dimensions. The \$1400, 14-ft shaft was repaired in 8 hr. Replacement would have taken 3 months.

usual repair operation. A solid Monel shaft, 14 ft x 6¼ in. diam, badly worn at the stern packing, was sprayed with stainless steel at Metallizing Engineering Co., Inc.

With nickel in critical supply, at least 2 to 3 months would have been required for delivery of a new Monel shaft stock and an additional week to machine it, at a cost between \$1200 and \$1400. However, even this high price would be far overshadowed by the loss of many thousands of dollars of rental revenue over a 2 to 3 month period. New York tugboats rent at \$60 per hour.

Monel Lasts Longer—Ordinary forged steel stock could be used to fabricate a new shaft and could probably be obtained in 2 to 3 weeks at a cost of about \$1000. Past experience, however, has shown the life of ordinary steel in this service to be only ¼ that of Monel.

Turned to Size—Worn portion of the shaft at the stern packing area was turned down in the lathe to 6⅞ in. diam and prepared with a special roughening tool. Next, about 8 lb of stainless steel was sprayed to bring the diameter to 6 5/16 in. and the shaft was then turned to the required 6¼ in. diam. Total time for the operation was 8 hours and the tugboat was back in service in 2 days.

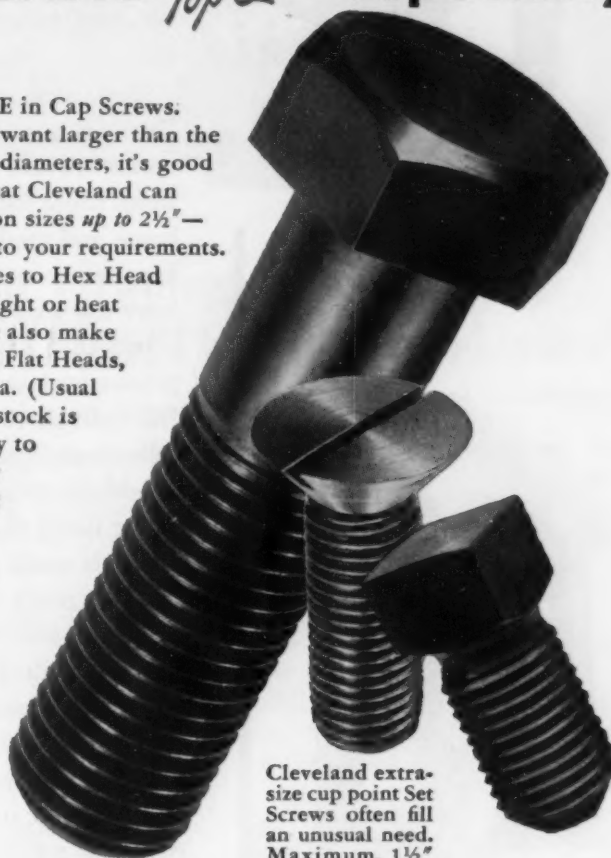


"There isn't much anyone can tell Charlie about machine tools..."



they're a **CLEVELAND** *Top Quality* specialty

Here's SIZE in Cap Screws. When you want larger than the listed 1½" diameters, it's good to know that Cleveland can serve you on sizes up to 2½" — in lengths to your requirements. This applies to Hex Head screws, bright or heat treated. We also make extra large Flat Heads, up to 1" dia. (Usual maximum stock is ¾".) We try to carry a fair assortment whenever possible. Write for sizes and prices.



Cleveland extra-size cup point Set Screws often fill an unusual need. Maximum, 1½" diameter, 10" length.

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THE CLEVELAND CAP SCREW COMPANY

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originators of the Kaufman **DOUBLE EXTRUSION** Process

Ask your jobber for Cleveland Fasteners

how Bill Morton grows plants he never sees



He's got a green thumb, no doubt about it. Bill Morton can make sick plants grow strong and sturdy. And when it comes to *industrial plants*—factories—the Bill Mortons of America, taken together, make *them* grow, too.

The lawnmowers, wheelbarrows, trowels, shovels, sprinklers and other assorted items these fellows buy for home and yard maintenance keep many a manufacturer busy the year around. The plants that produce with presses prosper best because Bill individually and collectively, prefers the lighter, smoother, stronger, less costly items that press methods make possible.

If you make metal products, you can't afford to overlook this established public preference, the food that makes factories grow. Let a Clearing engineer show you how to use it to lower your costs and expand your market.



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HAMILTON DIVISION, HAMILTON, OHIO

Technical Briefs

Stainless:

Austenitic alloys should be handled with care . . . Five danger areas.

Care must be used in annealing, hardening and handling austenitic stainless steel alloys during fabricating processes in order to insure maximum service life.

Metallurgical research at Superior Tube Co., Norristown, Pa., has re-emphasized five major danger areas which must be watched during the heat treating of austenitic stainless steel.

Carbide Precipitation—Many of the austenitic alloys are subject to damaging carbide precipitation when heated in the temperature range 900°-1600°F and this range should be avoided. It is advisable to regard 1900°F as the minimum annealing temperature for the austenitic series.

Rapid water cooling is usually necessary to bring the annealed austenitics through the 1600° to 900°F range and avoid carbide precipitation, especially for heavy sections.

Where water quenching causes appreciable distortion, air chamber cooling at a rate sufficient to bring the material below 800°F in a period of about 2 min will avoid carbide precipitation.

Precipitation—Where the alloy is protected against damaging carbide precipitation by the addition of stabilizing elements such as titanium, columbium or tantalum, it is often advantageous to purposely precipitate these complex alloy carbides—particularly if the part is to subsequently serve in the temperature range 900° to 1650°F. Types 321 and 347 are often treated for a period of one to ten hours at 1550° to 1650°F to accomplish this result.

Bright Anneal—It is considered difficult to bright-anneal alloys containing more than 12 pct chromium because a thin oxide of chromium usually results, and this is more difficult to remove than a heavier scale.

Research at Superior Tube Co. indicates bright-annealing can be accomplished in atmospheres of perfectly dry hydrogen or cracked ammonia, and under conditions which effectively exclude air infiltration to the furnace muffle.

Oxidizing Atmospheres—Where such specialized atmospheres are not obtainable, definitely oxidizing atmospheres are recommended, since the scale which is formed under these conditions is most easily removed in subsequent pickling operations.

All of the austenitic alloys absorb carbon rapidly at elevated temperature. For this reason these alloys particularly should be carefully cleaned by caustic or solvent vapor degreasing before annealing.

Embrittlement — These alloys are subject to zinc embrittlement, and should never be annealed after contamination with zinc or zinc-containing alloys. Tubing or other parts which have been formed on zinc alloy dies or brass guides or tools must be carefully cleaned before annealing by pickling in nitric hydrofluoric and other pickling solutions.

Powder Metal:

American metallurgists, scientists to lecture at Seminar June 22-26.

A number of leading American and European powder metallurgists, physicists and chemists have accepted invitations to attend the First Plansee Seminar "De re metallics" in Reutte, Tyrol, June 22 to 26. The seminar will be held at the Metallwerk Plansee Plant, and is sponsored by Dr. Paul Schwarzkopf, president of the American Electro Metal Corp., Yonkers, N. Y.

Among American metallurgists who will lecture at the seminar are: Dr. F. Clark and Prof. G. J. Comstock, Stevens Institute of Technology; Dr. H. H. Hausner, New York University; Dr. W. J. Kroll, Corvallis, Ore.; Dr. F. Lenel, Rensselaer Polytechnic Institute; Dr. J. T. Norton, Massachusetts Institute of Technology.

Turn to Page 184

June 5, 1952

Specialists in Metal-Cleaning Products



U. S. Army helmet. Wyandotte makes only the emulsion cleaner used in making this helmet.

"Excellent cleaning with WYANDOTTE emulsion cleaner"

—says army-helmet manufacturer

WHEN McCord Corporation of Detroit tackled the job of mass-producing hundreds of thousands of army helmets, they knew it was going to be a tough job. Many experts said these deep helmets couldn't be shaped of Hadfield steel in one press operation.

But McCord, the original supplier and builder of over 20 million army helmets, did the job . . . a testimony to their metal-working genius and attention to detail. That's why we're proud of our association with McCord.

Helpful Service

In their metal-cleaning operations, McCord uses Wyandotte emulsion

cleaner. Mr. Dean S. Fields, vice-president in charge of manufacturing, says: "Wyandotte emulsion cleaner gives us excellent results in cleaning army helmets prior to painting."

About Wyandotte service, Mr. Fields adds: "It's always a pleasure to have your man come into our plant."

Why not call your Wyandotte representative? His wide experience is certain to be useful to you, whatever your metal-cleaning problems. Wyandotte Chemicals Corporation, Wyandotte, Michigan; also Los Angeles 54, California.



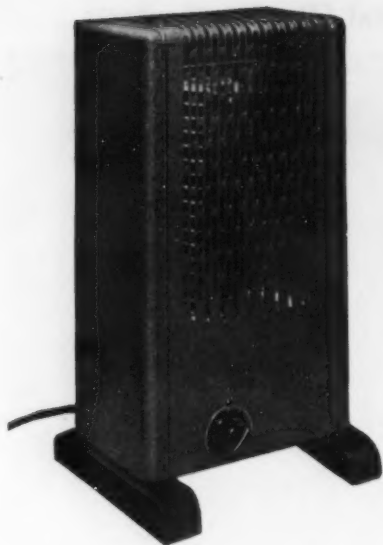
Largest manufacturers of specialized cleaning products for business and industry



Wyandotte

CHEMICALS

Helpful service representatives in 133 cities in the United States and Canada



Why not use Perforated Metal?

This Wesix Electric Heater shows a typical application of Hendrick Perforated Metal, combining utility and attractiveness. The heater guard is 20 gauge steel, with 3/16" x 1 1/2" side stagger perforations.

With facilities for producing any required shape and size of perforations in any commercially rolled metal, Hendrick invites inquiries from manufacturers who may be considering the use of perforated metal in connection with any of their products.



Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

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ONE STYLE PALLET

with Gerrard Steel Strapping
fits a variety of shipping needs!



Photo courtesy of International Harvester Company, Industrial Power Division

● As the picture shows, a pallet of standard members and dimensions can easily be adapted for handling a wide variety of tractor parts in interplant shipment. It is easy to make pallets of two, three, four or five layers, depending on the size of the parts to be palletized. And all pallets are reinforced with a single Gerrard Machine and 10 gauge Gerrard Round Steel Strapping. The uniformity of this palletizing system helps keep pallet costs down.

The strength and toughness of Gerrard Steel Strapping assures safe arrival

of materials at their destination. Gerrard Strapping complies fully with Army-Navy specifications JAN-P-106A, JAN-P-107 and JAN-P-108 for overseas packing.

A Gerrard engineer will help you devise a system of palletizing to fit your requirements. He will show you why it will pay you to choose the Gerrard Method of Strapping as your reinforcement. Gerrard Steel Strapping costs about 40% less than any other type of metal reinforcement. Contact a Gerrard engineer for further information.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL COMPANY
4705 South Richmond Street, Chicago 32, Ill.

U-S-S GERRARD ROUND STEEL STRAPPING

UNITED STATES STEEL



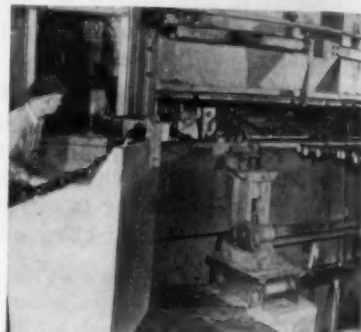
Technical Briefs

Pressure Tests:

Hydrostatic testing of oil well tubing put on production basis.

Pressure tests of pipe to 80 pct of yield point are being made by Spang-Chalfant Div. of National Supply Co. Oil well tubing and pipe casing may be subjected to pressures up to 10,000 psi by new hydrostatic pressure test equipment recently installed at the company's Ambridge, Pa., plant.

Simulated service tests, made on a production scale at the point of manufacture, are faster and more economical than field testing methods. They also eliminate uncertainties of predicting pipe performance on the basis of visible surface conditions which may be observed either by microscope or electro-magnetic inspection equipment.



PIPE TEST PRESSURES up to 10,000 psi can be applied by new testing machine set up in Spang-Chalfant plant of National Supply Co. Machine permits production pressure testing of piping under simulated service.

Automatic—Fully automatic operation is built in the equipment. Different phases of the test follow successively after pressing a button. Each operation can be activated by individual controls also. When holding test pressure for the normal period of five seconds, tests may be run at the rate of 120 per hr.

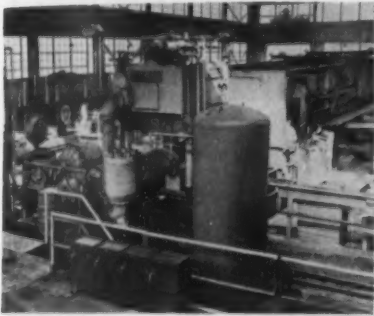
The new test bench, built by Hydro-press, Inc., is 86 ft long. Foundation for it and accessory equipment is 112 ft long and 42 ft wide at one end, with water sumps 13 1/2 ft deep.

Safety—Protection for the operator and other workmen near the tester is provided by the en-

closure and by elevating doors on both inlet and outlet sides.

Pipe enters the test bench on the side of the operator after rolling against adjustable stops that permit lifting one until it rolls into V-blocks on six pre-spaced clamping carriages. Carriages ride on side frames.

Filling Timer—The pipe is filled with water under 100 psi air pressure in a large water tank. A filling timer then closes the valves



HIGH PRESSURE EQUIPMENT requires foundation 112 ft long and 42 ft wide at one end with water sumps 13½ ft deep. Hydraulic equipment is in foreground.

and high pressure water is admitted from pressure intensifiers.

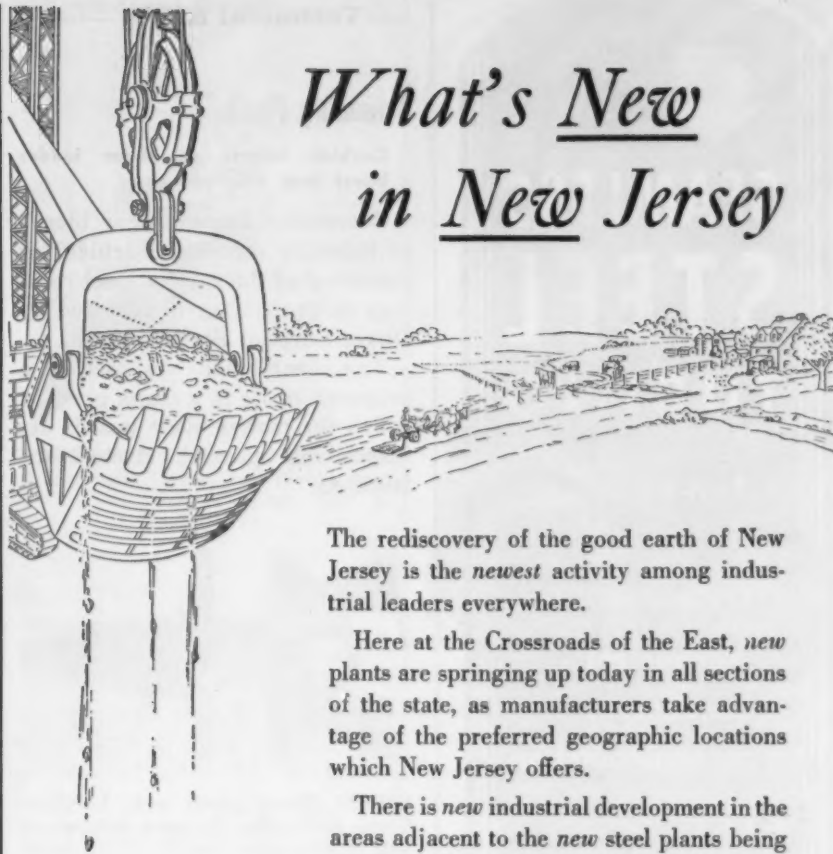
Pressure is normally held five seconds before release. Valves are then opened, the main ram returned, clamps are released except the one that opens after withdrawing the pipe from the far test head, the doors open, the pipe drains, and is removed from the bench by kick-out arms on each carriage.



"Haverhill's been putting in a little overtime lately."

Turn to Page 186

What's New in New Jersey



The rediscovery of the good earth of New Jersey is the *newest* activity among industrial leaders everywhere.

Here at the Crossroads of the East, *new* plants are springing up today in all sections of the state, as manufacturers take advantage of the preferred geographic locations which New Jersey offers.

There is *new* industrial development in the areas adjacent to the *new* steel plants being constructed, as well as in the sections served by *new* research facilities and *new* transportation arteries, such as the New Jersey Turnpike.

Yes, *new* industries are buying sites for use today and tomorrow. You can benefit, too, from everything which New Jersey offers industry, including these *new* opportunities for excellent locations for your plant.

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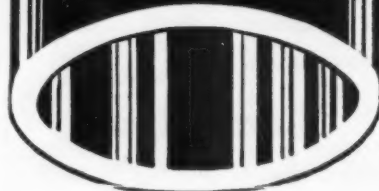
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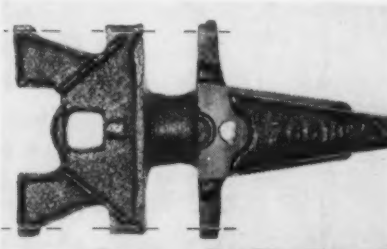
Technical Briefs

Trimming Flash:

Carbide inserts on shear blades boost tool life, cut costs.

Successful use of shear blocks of Carboloy cemented carbide for trimming of flash from steel castings in production is reported by Oliver Corp. of Shelbyville, Ill.

The shear blades are used on a progressive die in a crank press in which the mower blade guards are respectively pierced, riveted and trimmed.



MOWER BLADE guards made by Oliver Corp., Shelbyville, Ill., were trimmed of flash in crank press. Tool life of trim blocks was limited to 12,000 pieces.

Trim Blocks — The shear die originally had two steel trim blocks, one on each side of the die, to simultaneously shear six faces varying in length from $\frac{1}{4}$ to $\frac{5}{8}$ in., three on each side of a SAE 1045 casting.

Tool life of the trim blocks, relative to the other tools in the progressive die, was comparatively short and they had to be changed at the end of each day (12,000 pieces) on the cutting edges of the trim blocks proved to be the answer to the problem.

Brazed On—Original trim blocks were altered to receive the inserts by grinding a step in each and the inserts, of Carboloy Grade 55A tungsten carbide, were then brazed on the steps at intervals along each block to correspond with the casting faces to be sheared.

The blow is taken on the $\frac{1}{4}$ -in. face of the inserts and because the parts are not stripped, there is a $\frac{1}{64}$ in. over-hang of the carbide to provide free clearance to facilitate removing the part before the die head moves back to the top. No

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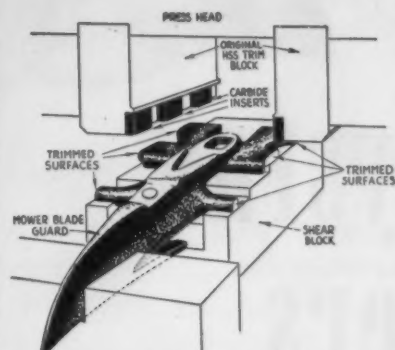


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Per Edge of Blade

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HOMESTEAD - PENNSYLVANIA

Technical Briefs



CARBIDE INSERTS brazed to high speed steel trim block jumped tool life to over 100,000 pieces between grinds. Blow is taken on 1/4 in. face of insert.

difficulty has been encountered from this supported over-hang.

With the carbide blocks tool life of the shearing die has been increased to well over 100,000 pieces between grinds. Very little grinding is needed at the time of sharpening and there has been no sign of the cutting edges being chipped or broken under the continuous impacts.

Down Under:

Australians celebrate opening of earth mover plant by moving hill.

A woman deftly dug the blade of a big 15-ton bulldozer into the side of a hill near Sydney, Australia, recently to mark completion of first new electric controlled equipment made at the Aussie's new LeTourneau (Aust.) Pty., Ltd. factory. Four types of prime earth movers are being built at the plant.

The Rydalmere State School benefits from the demonstration of first of the new units off the assembly line. Before high Government officials the machines began moving aside a hill to make a playing field for the school. In the demonstration some 25,000 cu yards of earth were moved.

To the Mines—Production at the new plant is geared to one unit per week of the Tournapull, Tournarocker, Tournahopper and carryall scraper. First of the new machines will begin work next month in open cut mines on the New South Wales coal fields.

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Consumers Face New Strike With Fair Inventories

Steel stocks of manufacturers average about 30 to 45 days' supply . . . Some have 60 days . . . Mill shutdowns are generally orderly . . . Hold little hope for early end.

Manufacturing industries should not be hurt too badly if the steel strike doesn't last more than 2 or 3 weeks. Steel consumers' inventories generally range between 30 and 45 days' supply. Some manufacturers have less than 30 days' supply on hand; a few have as much as 60 days' or more.

An IRON AGE check of inventories in major steel consuming centers shows an operating inventory (including all steel items) for most firms ranging between 2 and 6 weeks. A few firms will feel the strike almost immediately. But extensive manufacturing cutbacks are not expected for at least 2 or 3 weeks. If the strike should last more than 3 weeks, manufacturing cutbacks would start coming quickly.

Inventories—In stating their inventories, some steel consumers listed "operating" inventories which include all steel items they use. Others listed "average" inventories. In some cases it is believed that lack of one or two vital steel items might halt production even though average inventories look pretty good.

The automotive industry appears to have enough steel on hand for about 4 or 5 weeks' production. Some firms, of course, have less.

As in the past, it might be necessary for auto firms to use part of their steel inventory to bail out some of their suppliers who may be harder hit by the strike. During past strikes such rescue missions have shortened inventories of auto steel.

Warehouse Report—Warehouses rate their inventories about 55 pct of "normal," the highest they've

been for many months. On some of the easier items they have been able to accumulate pretty good stocks. On tight items—such as large sizes of bars, plates, and structurals—their inventories are meager. National Production Authority froze warehouse stocks for military priority, as it did during the two previous strikes.

Nearly all steel consumers THE IRON AGE contacted seem to be impressed with the seriousness of this strike. Few believe it will end as quickly as the two previous "short" strikes. There is little evidence that manufacturers will curtail output to stretch out steel supplies. Most plan to keep operating as long as steel supply permits in the hope that the strike will somehow be ended. Others plan output slowdowns when inventory sags.

Self Help—Some consumers are displaying real ingenuity with quick plans to get the most out of their steel inventory. For example, one manufacturer of stampings reports it will be able to hold out on both cold-rolled and hot-rolled strip until August by slitting and cutting the coils it has on hand to the desired size. A manufacturer of materials handling equipment says it is in a little better shape than at the time of the last shutdown. This firm sees 60 days' production in its inventory.

The most critical steel items are carbon bars, heavy plates and structurals, forgings, seamless steel tubing, and some special alloys. Special alloys will prove troublesome because of the long lead time between placing of orders and actual shipment. Delivery of such items might be stretched

out much longer than the actual number of days lost by the strike.

Still Operating—Among the basic steel producers which are expected to keep operating during the strike are Alan Wood Steel Co., part of Armco Steel Corp., Barium Steel Corp., Ford Motor Co., Kaiser Steel Corp., and Weirton Steel Co. Several non-integrated companies will also continue to produce. Recently NPA has been directing an increasing tonnage of semi-finished steel to finishing mills that might be left operating during a strike.

First reports indicate the strike proceeded in a fairly orderly manner. Pickets started surrounding some Midwest steel mills minutes after the Supreme Court decision was made public. Less than an hour after the court announcement Philip Murray, president of the United Steel Workers, issued the strike call. He directed local unions to provide workers to help close the mills without undue damage, and to provide necessary maintenance during the shutdown.

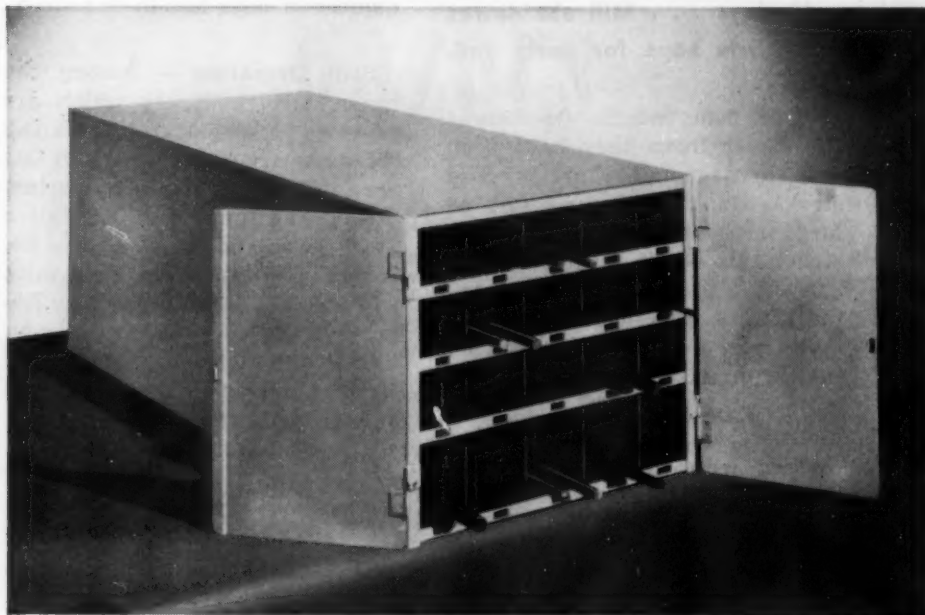
Bleak Outlook—President Truman was expected to make another strong effort to obtain legislation which would enable him to legally seize the industry. In view of the heat of controversy, rapid passage of such legislation did not seem likely. The President could also use a Taft-Hartley injunction to keep the steel workers on the job if he so desired. This he has previously refused to do. The bitterness which has been generated among all sides during the long battle will not help the parties reach an early agreement.

Ingot Rate Plummets—Steel-making operations are estimated at 29 pct of rated capacity, down 72½ pct from the previous week.

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FOR ALL METAL PRODUCTS MANUFACTURERS!

Here's Sure Spec...the finest quality drill rod money can buy...with a safe, sturdy steel cabinet to store and protect it!



Cabinet stocks 3 ft. lengths

Sure Spec drill rod is high grade tool steel — comes in manufacturers' standard sizes at low prices!

Rounds from .013" to 2"
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Flats from 1/16" x 1/8" to 1/2" x 1"

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this easy purchase plan...

This is no ordinary storage box. The cabinet is all steel outside and has removable steel partitions to provide various bin sizes. Bin floors are wood. Doors are equipped with hasp for pad-lock. Bins have slots at front for rod size tickets for easy selection and stock checking. Cabinet is painted an attractive orange inside and out, with black walls and floors for the bins. Stocks rounds, flats and special shapes up to 36" long in its 20 bins. Imprinted on the inside of the doors are fractional, decimal and weight equivalents of standard Sure Spec drill rod sizes.

This safe, sturdy steel storage cabinet, designed to protect your drill rod, is yours with one of these easy plans:

- 1** You may purchase the cabinet alone for \$24.95 f.o.b. Cleveland.
- 2** Or you may get the cabinet free with an initial order of \$150 of Sure Spec drill rod.
- 3** Or you may get a \$24.95 credit for the cabinet if you purchase \$150 worth of Sure Spec Drill rod within a 90-day period.

Send your order today for plan 1, 2 or 3.

Or Write Today for comprehensive data book detailing all the facts about Sure Spec drill rod, such as sizes, analysis, uses and treating. Also, at your request, one of our sales engineers will call to discuss your particular drill rod requirements and quote prices.

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Market Briefs

Retail Inventories Low—Still smarting from stock losses suffered last year as a result of consumer resistance, retailers are holding inventories at worked-down levels, reports Research Institute of America, Inc. Despite a slight pick-up in several of the badly sagging lines, most merchants are placing orders later and in smaller quantities than last year. Manufacturers warn that delayed buying will result in dislocated production schedules and spotty deliveries.

Heavy Casting from Europe—Defense Production Administration's inspection of European foundries shows foreign facilities are now available for production of heavy steel castings. A 3-week spot check of England, France, Germany and Italy turned up foundry facilities and machining capacity capable of producing castings up to 176 tons. U. S. heavy casting foundries are already booked far ahead and DPA reports European plants are anxious to pick up the excess and would promise good delivery dates.

No Machinists—Vital work on Navy projects such as turbines and hydraulic valves is being held up at the Westinghouse plant in Sunnyvale, Calif. The firm has been trying unsuccessfully to get 300 skilled machinists since January. Locally trained men soon turn into "one jobbers" who must be retrained when the work load shifts.

Britain Loses Trade—Czech Skoda works recently shipped 271 cars for use by the Egyptian army, an order Britain had hoped to get. Germany is also muscling in on much of the Egyptian trade lost by Britain and was also hopeful of landing the car order before it was given to Czechoslovakia. Egypt is expected to switch more of its orders from the West to Iron Curtain countries.

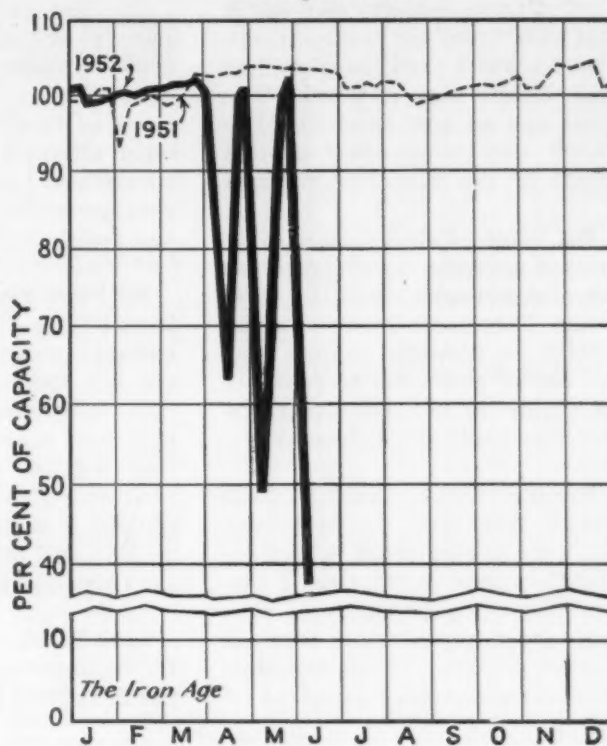
New Coal Mine—U. S. Steel Co.'s newest coal mine, situated on a mountainside near Gary, W. Va., is already producing 4000 tons of metallurgical grade coal per day. Potential output is 10,000 tons per day. Coal from the mine will go to U. S. Steel operations in Indiana, Illinois and Ohio. Called Gary No. 14, the mine is completely mechanized.

Record Ore Haul—Great Lakes' ore-carrying fleet, already headed for new records, recently made its largest weekly haul—3,081,368 gross tons. The whopping 7-day total boosted this year's tonnage total to 16,497,539 as compared with 16,372,189 for the same period last year.

Gas Hike Asked—Texas Gas Transmission Corp. has asked the Federal Power Commission for an \$11 million rate rise on its wholesale natural gas. Increase would be the first in 10 years, report company officials, and is needed to offset increased business cost. If approved, the rate increase would be apportioned among utility customers of Texas Gas in an 8-state area from Louisiana to Ohio. Almost \$8.5 million of the requested \$11 million is said to represent added cost of natural gas to the company. Higher operating costs account for the remainder.

With Strike—Defense Production Administration immediately re-issued Dir. 11 freezing all warehouse steel in defense classifications. An interdepartmental committee was instructed to screen requirements of various agencies so that the steel could be channeled by directive on the basis of greatest need.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
May 25	101.9*	105.0	101.0*	101.0	106.0	104.0	103.0*	107.0*	98.0	102.0	91.0	95.5	90.5	102.5
June 2	22.0	22.5	22.0	30.0	37.5	22.5	21.0	47.5	64.0	22.0	65.0	20.5	19.5	29.0†

Beginning Jan. 1, 1952, operations are based on annual capacity of 108,587,570 net tons.

* Revised.

† Estimated.

Industry Raps NPA Copper Proposal

Half-slave, half-free market cannot work, claims trade . . .

Would have all price and distribution controls removed . . .

Zinc price cut expected very soon—By R. L. Hatschek.

National Production Authority has "solved" the problem of allocating copper under the system where consumers may pay the world price for foreign copper. But the solution is getting a lot of criticism from industry. The agency would allocate the total domestic production—an estimated 80,000 tons per month—and buyers would be authorized to purchase up to 50,000 tons a month of foreign copper. The total, 130,000 tons, is our International Materials Conference allocation.

First thing industry men say is that 50,000 tons are just not available on world markets. They feel that 25,000 tons a month from Chile and an additional 10,000 to 15,000 tons from other sources would be the maximum possible.

Big Gripe—Fabricating subsidiaries of domestic copper producers are also unhappy about the 60-40 setup. They have been operating wholly on domestic copper from the parent producers at 24.5¢ per lb. Under the new allocation system they couldn't continue this.

Pricing—Many people in trade circles feel that the half-slave, half-free pricing setup is impossible. They point out that world copper prices may change with even daily frequency and then they ask how often Office of Price Stabilization will alter ceiling prices.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in May based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	24.50
Lake copper, delivered	24.625
Straits tin, New York	\$1.215
Zinc, East St. Louis	19.50
Zinc, New York	20.328
Lead, St. Louis	15.531
Lead, New York	15.731

The hue and cry for complete removal of ceilings on copper and copper products is rising as a result. Some are even calling for removal of distribution controls. Another alternate proposal calls for government subsidy, having the government buy all foreign copper and resell at the domestic ceiling.

Set Price Floor—One report has it that Chile has lifted the export embargo provided that the producers sell their metal for no less than 35.5¢ per lb. But no sales have been heard of. Whether business will be transacted at that level or not is impossible to foretell but it seems quite likely that trading will take place at not too far from that price.

Lead Tariff—Average lead price for the month of May was 15.731¢ per lb at New York. This makes it

mandatory for President Truman to reimpose the 1 1/16¢ per lb tariff on metal and the 3/4¢ import duty on lead content of ores and concentrates. The action may take place at any time now and cannot be delayed beyond the first week of July. With yet another big steel merry-go-round whirling through the Capitol, no one can predict when it will happen.

Bolivian Tin—Reconstruction Finance Corp. last week closed a deal with two of the large Bolivian tin producers for concentrates already piled up at Chilean ports. Price was \$1.17 1/2 per lb f.o.b. making the New York equivalent of \$1.21 1/2. No detailed figures on the quantity were made public but the estimate was placed at about 10,000 tons of tin content.

No long-term agreement was made for tin yet to be mined and there are still no new developments in this picture.

Not Critical—International Materials Conference has decided zinc is in ample enough supply to be removed from the critical list. Remaining second quarter allocations were suspended and no allocations will be made for the third quarter. Foreign zinc has now been offered as low as 17 1/2¢ per lb at New York but the material found no takers.

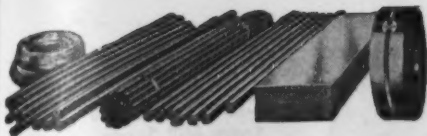
Reason was that most consumers felt a domestic price cut was imminent and they were dipping into stocks while waiting for developments. Demand for Prime Western grade had been holding up the market but, with a new strike in the steel industry, demand took a nosedive. And the price dropped 2¢.

Silver Down—Domestic quotation for silver is off another 1 1/4¢ as demand remains slow. Substantial offerings of foreign metal are being made. The price dipped five times in May, coming down to 82.75¢ per Troy ounce from the 88¢ level that had prevailed since last October.

NONFERROUS METAL PRICES

	May 28	May 29	May 30	May 31	June 2	June 3
Copper, electro, Conn.	24.50	24.50	....	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	....	24.625	24.625	24.625
Tin, Straits, New York	\$1.215	\$1.215	....	....	\$1.215	\$1.215
Zinc, East St. Louis	19.50	19.50	....	19.50	17.50	17.50
Lead, St. Louis	14.80	14.80	....	14.80	14.80	14.80

Note: Quotations are going prices.

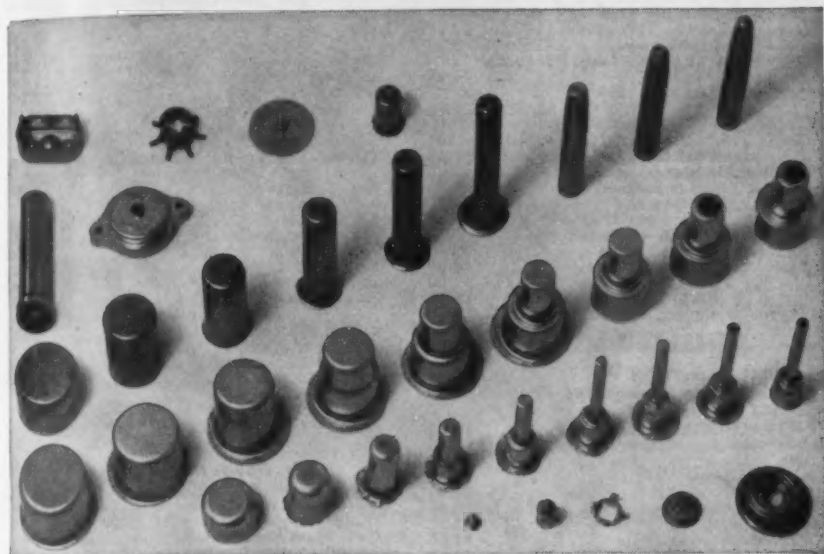


BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN



MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



Surprisingly complicated items from sheet metal can be made on eyelet machines.
Courtesy The Formatic Company, Naugatuck, Connecticut.

Cutting Costs Through Eyelet Machine Operations

If you have occasion to use, say, over 50,000 pieces of a fairly small article made from sheet metal, it is worthwhile to investigate eyelet machine production as against that made by single press operations.

The eyelet machine was originally designed for making small metal eyelets for shoes. With the development of larger machines, other items such as screw shells and socket shells and stampings were added. Today, standard eyelet machines can handle metal up to about .050" thick and can draw shells up to 3" deep. The eyelet machine can combine such operations as blanking, cupping, drawing, piercing, trimming and even roll-threading and side piercing.

Long Runs

Economy of eyelet machine operation depends on long runs. Tool costs are higher than for the single press method because more steps are performed in bringing the metal to the final shape in gradual stages. Also, setting-up time is generally longer, taking

from two to three days. For jobs that can use an eyelet machine day in and day out, a remarkably low cost per piece can be achieved which more than offsets the higher tool cost.

Other advantages are less waste of material when getting started with a new job. In a matter of minutes you can tell if the finished product is correct as to dimensional specifications. On the other hand, it may take weeks to obtain the finished part which has to undergo the number of operations required with single press operations. This saves material by keeping spoilage to a minimum because of wrong tooling or incorrect radii and other dimensions.

Other economies are 1. no intermediate annealing operations; 2. no handling of separate batches for each operation; 3. no danger of injury and accumulation of dirt on parts while waiting for available presses; 4. better control on number of pieces required. Once the job gets into production, finished items leave the eyelet machine

in a constant stream. This means quicker deliveries, less handling and a correspondingly lower unit cost.

Expert Tool Designing

From the production standpoint eyelet machine operation is more difficult than single press operation. The eyelet machine toolmaker is a highly skilled mechanic, who must be a master at tool construction capable of performing all of the operations which the machine can do. In designing tools the increase in length of a shell is the result of reducing the outside diameter without appreciably thinning the wall. Operations must be so balanced that the metal does not become hardened too much in the early stages; otherwise, it will be too hard in temper to withstand subsequent operations. Deep shells are generally run with a slight flange to permit easy stripping and for freedom from edge cracking.

On long runs for brass or for ferrous materials, carbide dies are often used to withstand wear and permit closer tolerances. Good lubricants must be used to reduce friction between the metal and the dies.

Correct Temper and Quality

The copper-base alloy must be free from imperfections such as spills and blisters. The grain size must be comparatively fine in order to impart strength which is necessary to resist breakage when the metal stretches during forming and drawing operations. Some jobs require metal with small grain size because a smooth surface suitable for polished finishes is called for.

Bridgeport recognizes the importance of supplying eyelet metal of the correct temper or grain size for each job, uniformity of anneal, and the highest quality. In general, eyelet machine operations are so severe that poor quality metal will cause interrupted production and excessive spoilage. When working on a new job, the Bridgeport Laboratory will be glad to help specify the correct alloy and temper which will give the highest performance. (8339)

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 62S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 38.5¢; 62S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 62S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.
Plate 1/4 in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 62S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.
Extruded Solid Shapes: shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to 116¢; 36 to 38, 47.2¢ to 117¢.
Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 38.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5 to 35¢.
Screw Machine Stock: Rounds, 11S-T3, 1/4 to 1 1/2 in., 53.5¢ to 42¢; 3/8 to 1 1/2 in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.
Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 62S, 48¢ to 35¢; 66S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 76S-T6, 84¢ to 67.5¢.
Extruded Tubing, Rounds: 63S-ST-5, OD in. 1 1/4 to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.
Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., 11.42¢; 96 in., 15.22¢; 120 in., 19.02¢; 144 in., 22.28¢. Gage 0.24 x 28 in., 72 in., 11.37¢; 96 in., 11.83¢; 120 in., 12.29¢; 144 in., 12.75¢. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: F51-O, 1/4 in., 63¢; 3/16 in., 66¢; 1/2 in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.
Extruded Round Rod: M, diam in., 1/4 to 0.311 in., 74¢; 1/2 to 3/4 in., 57.5¢; 1 to 1.749 in., 63¢; 2 to 5 in., 48.5¢. Other alloys higher. Base up to 3 in. diam, 10,000 lb; 3 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.
Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.8¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 63.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.50 lb, 20,000 lb; 1.50 and heavier, 30,000 lb.
Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.067; 1/4 in. to 5/16, 11.40¢; 5/16 to 3/8, 11.26¢; 3/8 to 1/2, 95¢; 1 to 2 in., 76¢; 0.165 to 0.219, 3/4 to 1, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in. in.: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, 115¢; Plate, HR, 112¢; Wire, rolled and/or drawn, 110¢; Bar, HR or forged, 106¢; Forgings, 106¢.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60 1/2
Strip, cold-rolled	83	63 1/2
Rods and bars	73	58 1/2
Angles, hot-rolled	73	58 1/2
Plates	75	59 1/2
Seamless tubes	106	93 1/2
Shot and blocks		53 1/2

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68		41.28
Copper, h-r		37.53	
Copper, drawn		38.78	
Low brass	39.67	39.36	
Yellow brass	38.28	37.97	
Red brass	40.14	39.83	
Naval brass	43.20	37.26	38.52
Leaded copper		41.58	
Com'l bronze	41.13	40.82	
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.82	52.04	

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed 19.00
Aluminum pig 18.00
Antimony, American, Laredo, Tex. 39.00
Beryllium copper, 2.75-4.25% Be. 15.5¢
Beryllium aluminum 5% Be, Dollars per lb contained Be. \$69.50
Bismuth, ton lots 22.25
Cadmium, del'd 22.25
Cobalt, 97-99% (per lb) \$2.40 to \$2.47
Copper, electro, Conn. Valley 24.50
Copper, Lake, delivered 24.625
Gold, U. S. Treas., dollars per oz. \$35.00
Indium, 99.8%, dollars per troy oz. \$2.25
Iridium dollars per troy oz. \$200
Lead, St. Louis 14.80
Lead, New York 15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb. 24.50
Magnesium, sticks, 100 to 500 lb. 42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York \$198 to \$201
Nickel electro, f.o.b. N. Y. warehouse 59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel 52.75
Palladium, dollars per troy oz. \$24.00
Platinum, dollars per troy oz. \$90 to \$93
Silver, New York, cents per oz. 82.75
Tin, New York 13.215
Titanium, sponge 55.00
Zinc, East St. Louis 17.50
Zinc, New York 18.33
Zirconium copper, 50 pct 66.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot
No. 115 27.25
No. 120 26.75
No. 123 26.25
80-10-10 ingot
No. 305 33.00
No. 315 30.50
88-10-2 ingot
No. 210 41.50
No. 215 40.00
No. 245 34.50
Yellow ingot
No. 405 23.25
Manganese bronze
No. 421 30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper, max. 20.6
0.60 copper, max. 20.4
Piston alloys (No. 122 type) 21.2
No. 12 alum. (No. 2 grade) 19.5
108 alloy 20.6
195 alloy 20.8
13 alloy 20.8
ASX-679 20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1-95-97 1/2% 18.80
Grade 2-92-95% 18.60
Grade 3-90-92% 18.40
Grade 4-85-90% 18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper
Cast, oval, 15 in. or longer 37.84
Electrodeposited 33 1/2
Flat rolled 38.34
Forged ball anodes 43
Brass, 80-20
Cast, oval, 15 in. or longer 34 1/2
Zinc, oval 26 1/2
Ball anodes 25 1/2
Nickel, 99 pct plus
Cast 76.00
Rolled, depolarized 77.00
Cadmium 32.40
Silver 999 fine, rolled, 100 oz lots, per troy oz., f.o.b. Bridgeport, Conn. 97 1/2

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum 63
Copper sulfate, 99.5 crystals, bbl. 12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed 20 1/2
Nickel chloride, 375 lb drum 27 1/2
Silver cyanide, 100 oz lots, per oz. 67 1/2
Sodium cyanide, 96 pct domestic 200 lb drums 19.25
Zinc cyanide, 100 lb drum 47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1/4¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21 1/2	20 1/2
Yellow brass	19 1/2	17 1/2
Red brass	20 1/2	19 1/2
Comm. bronze	20 1/2	19 1/2
Mang. bronze	18 1/2	17 1/2
Brass rod ends	18 1/2	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire 19.25
No. 2 copper wire 17.75
Light copper 16.50
Refinery brass 17.35
Radiators 14.75
* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire 19.25
No. 2 copper wire 17.75
Light copper 16.50
No. 1 composition 18.50
No. 1 comp. turnings 18.25
Rolled brass 15.50
Brass pipe 16.50
Radiators 14.75

Aluminum

Mixed old cast 9.75
Mixed new clips 11.90
Mixed turnings, dry 9.80
Pots and pans 9.25

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire 18 1/2-19 1/2
No. 2 heavy copper and wire 17 -17 1/2
Light copper 15 1/2-16
New type shell cuttings 15 1/2-16
Auto radiators (unsweated) 14 -14 1/2
No. 1 composition 17 1/2-18
No. 1 composition turnings 17 -17 1/2
Unlined red car boxes 16 1/2-17
Cocks and faucets 16 -15 1/2
Mixed heavy yellow brass 11 1/2-12
Old rolled brass 14 1/2-15
Brass pipe 15 1/2-16
New soft brass clippings 16 -16 1/2
Brass rod ends 15 1/2-16
No. 1 brass rod turnings 15 -15 1/2

Aluminum

Alum. pistons and struts 6 -6 1/2
Aluminum crankcases 7 -7 1/2
2S aluminum clippings 10
Old sheet and utensils 7 -7 1/2
Borings and turnings 5 -6
Misc. cast aluminum 7 -7 1/2
Dural clips (24S) 7 -7 1/2

Zinc

New zinc clippings 11 1/2-12
Old zinc 8 1/2-9
Zinc routings 6 -6 1/2
Old die cast scrap 5 1/2-6

Nickel and Monel

Pure nickel clippings 35 -36
Clean nickel turnings 35 -36
Nickel anodes 35 -36
Nickel rod ends 35 -36
New Monel clippings 28 -29
Clean Monel turnings 28 -29
Old sheet Monel 13 -14
Nickel silver clippings, mixed. 13 -14
Nickel silver turnings, mixed. 13 -14

Lead

Soft scrap, lead 11 -11 1/2
Battery plates (dry) 6 1/2-7
Batteries, acid free 4 -5

Magnesium

Segregated solids 15 -16
Castings 14 -15

Miscellaneous

Block tin 100 -110
No. 1 pewter 70
No. 1 auto babbitt 60
Mixed common babbitt 13 1/2-14
Solder joints 19 -20
Siphon tops 18 -18 1/2
Small foundry type 14 1/2-15
Monotype 12 1/2-13
Lino. and stereotype 11 -11 1/2
Electrotype 8 1/2-9
Hand picked type shells 6 -6 1/2
Lino. and stereo. dross 5 -5 1/2
Electro. dross 5 -5 1/2

"THEY SHALL NOT PASS"

says LEAD to harmful radiation

The harnessing of atomic energy has brought with it the problem of controlling the powerful rays emitted during atomic disintegration. Basically, protection from these rays is similar to the protection afforded by lead against the harmful effects of X-rays and radium emanations. Despite the enormous penetrating power of the rays emitted by atomic pile reactors, lead is still the most important metal for guarding personnel against harm by radiation exposure.

The impermeability of the shielding material is a function of its density. Lead, which is the densest commonly available metal, will give the greatest protection per unit of thickness, and for that reason is the least bulky and usually the lightest and most economical for such shielding. Other advantageous properties which recommend the use of lead for this purpose can be summarized thus: • Lead is relatively abundant, low in cost and has a high salvage value • Lead is radioactivation-proof; it does not become contaminated by exposure to radiation and thus may be used continuously without fear of itself becoming radioactive • Metallic lead has an advantage over various aggregate materials such as concrete in that a uniform density is guaranteed throughout • Lead is easily utilized for this purpose; in the form of brick it is readily shifted from place to place for temporary protective requirements.

Since none of its physical and chemical characteristics are altered by this type of service, the metallic lead used in radiation-barriers is recoverable and thus increases the nation's strategic, lead-in-use stockpile.

Activity	ENERGY (Mev)								
	0.2	0.5	0.8	1.0	1.5	2.0	2.5	3.0	4.0
10 mc.....	-0.14	-0.36	-0.27	-0.11	+0.37	+0.78	+1.15	+1.40	+1.70
20 mc.....	-0.00	-0.00	+0.41	+0.76	+1.57	+2.16	+2.63	+2.91	+3.21
50 mc.....	-0.01	+0.47	+1.31	+1.90	+3.15	+4.00	+4.57	+4.90	+5.20
100 mc.....	+0.06	+0.82	+1.99	+2.77	+4.34	+5.38	+6.05	+6.41	+6.71
200 mc.....	+0.10	+1.17	+2.67	+3.63	+5.54	+6.77	+7.52	+7.92	+8.21
500 mc.....	+0.17	+1.64	+3.57	+4.78	+7.12	+8.60	+9.47	+9.91	+10.21
1 c.....	+0.23	+1.99	+4.25	+5.65	+8.31	+9.99	+10.95	+11.41	+11.71
2 c.....	+0.28	+2.35	+4.93	+6.52	+9.51	+11.37	+12.42	+12.92	+13.22
5 c.....	+0.36	+2.81	+5.82	+7.66	+11.09	+13.21	+14.37	+14.91	+15.21
10 c.....	+0.41	+3.17	+6.50	+8.52	+12.28	+14.59	+15.85	+16.42	+16.72
20 c.....	+0.47	+3.52	+7.18	+9.39	+13.48	+15.98	+17.32	+17.93	+18.23
50 c.....	+0.54	+3.99	+8.08	+10.54	+15.06	+17.81	+19.27	+19.92	+20.22
100 c.....	+0.60	+4.34	+8.76	+11.40	+16.25	+19.20	+20.75	+21.43	+21.72
Danger range	Plus	Plus	Plus	Plus	Plus	Plus	Plus	Plus	Plus
20 cm.....	+0.26	+1.64	+3.16	+4.02	+5.55	+6.44	+6.85	+7.00	+7.00
50 cm.....	+0.11	+0.71	+1.36	+1.73	+2.39	+2.77	+2.95	+3.01	+3.01
1 m.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2 m.....	-0.11	-0.71	-1.36	-1.73	-2.39	-2.77	-2.95	-3.01	-3.01
5 m.....	-0.26	-1.64	-3.16	-4.02	-5.55	-6.44	-6.85	-7.00	-7.00
10 m.....	-0.37	-2.35	-4.52	-5.76	-7.94	-9.21	-9.80	-10.01	-10.01
Working time, hr/day	Plus	Plus	Plus	Plus	Plus	Plus	Plus	Plus	Plus
1.....	-0.17	-1.06	-2.04	-2.60	-3.89	-4.16	-4.42	-4.52	-4.52
2.....	-0.11	-0.71	-1.36	-1.73	-2.39	-2.77	-2.95	-3.01	-3.01
4.....	-0.06	-0.35	-0.68	-0.87	-1.20	-1.39	-1.47	-1.51	-1.51
8.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24.....	+0.09	+0.56	+1.08	+1.37	+1.89	+2.20	+2.34	+2.39	+2.39

THICKNESS OF LEAD REQUIRED FOR SHIELDING FROM GAMMA RAY SOURCES (Table prepared by the NATIONAL BUREAU OF STANDARDS)

Select the column for the energy required. The entry gives thickness in centimeters of lead for different radiation strengths at 1 meter for 8 hours per day to give 50 milliroentgens. Then add algebraically the correction terms for other working ranges or times to obtain the shield thickness required.

Example: Shield is required for the manipulation of 500 millicuries of radioactive material emitting 1.5 electron volts (Mev) gamma rays at a minimum working distance of 50 cm., and for 4 hr./day.

Shield thickness = $8.60 + 2.77 - 1.39 = 9.98$ cm. of lead in which
(a) (b) (c)

a = basic entry.

b = correction for danger range = 50 cm.

c = correction for 4 hr./day.



One face of the Clinton chain-reacting uranium pile is equipped with holes for experimental purposes. Two physicists are demonstrating an experiment with a defined beam of radiation emerging through hole

No. 20. The thick house of lead bricks in the foreground stops the beam after passing the experimental device. Lead bricks in background are available for shielding whenever needed. U. S. Signal Corps photo

ST. JOSEPH LEAD CO.

250 PARK AVENUE, NEW YORK 17, N. Y.

THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES

Iron and Steel Scrap Markets

Scrap Again Strike Partner to Steel

Scrap shipments dwindle . . . Sales lost each day . . . Many mills loaded with scrap as trade pushes movement . . . Mills less likely to stockpile heavily at outside depots.

The steelworkers' union bolted out on strike almost immediately after the Supreme Court had ruled against the Truman seizure of the steel industry. The scrap industry saw its shipments slashed to the bone. For the third time this year the scrap industry became steel's involuntary partner in shutdown.

Mills had been operating at capacity. When the strike is over, operations will be resumed at the same tempo. This meant that the strike lull meant irretrievably lost production. And it also meant lost scrap sales to the scrap industry.

What was the reaction of scrap men? For the most part, as responsible businessmen, they favored the court decision, knowing that lawless action from whatever high source was not to be condoned. But they could not repress a shudder. Scrap stockpiles at mills loomed as high as mountains. Mills were much less likely to stockpile scrap at outside depots.

Scrap people in the past few weeks have been anxious to ship. Areas that formerly were lethargic erupted into energetic scrap movement. Pittsburgh, a scrap-minus area, was flooded with scrap.

Despite weakness in some grades the scrap market was in the main holding at ceiling prices. What happens after the strike was the problem facing scrap men. Mills will enter the market with intact, heavy inventories. Scrap will have accumulated. A long strike was seen as spurring below-ceiling price trends.

Pittsburgh — The turnings market here was so weak before the strike it will be a long time before it gets up off the floor. On an appraisal basis short turnings were worth no more than \$35 per ton delivered. One consumer said he turned down a firm offer of a substantial tonnage at \$33

delivered. It was generally agreed, though, that this was not a true indication of the market. Virtually none of the mills were buying. Heavy melting grades were "coming out of our ears" as one consumer put it.

Chicago—When the strike hit scrap it was not doing very well across the board, here last week. Buyers were quiet, mill supplies were well up, and even in openhearth grades there was a noticeable slowing of scrap flow. Electric furnace had been moving very slowly, although no below market sales could be confirmed.

Philadelphia—The steel strike began to pinch scrap shipments early this week. Until then openhearth grades were still moving steadily at ceiling prices. Last sales of blast furnace turnings were at ceiling prices but scrap sources expected them to dip very soon. Cupola cast was off another \$2 to \$38 to \$39 and little business was done in other cast grades. Electric furnace material was spotty with some being shipped as No. 1 steel.

New York—The steel strike dealt a heavy blow to scrap movement this week. Although scrap people in principle favored the Supreme Court decision against seizure, they could not repress a shudder at what a long strike could do. Mills were starting to flash the red light to shipments early this week. Some scrap men were thinking that a long strike would mean certain below-ceiling sales afterward.

Detroit—Although the steel strike called all bets off, the trade was waiting for a pattern in blast furnace grades to develop. Big buyers who will set the price were sitting tight behind comfortable inventories and watching for the strike. Below-ceiling prices had been established in small tonnages, but not in significant sizes. Listings of blast furnace grades in auto plants last week brought ceilings.

But these companies are in a position to command a higher price than the regular market. These ceiling sales are not indicative of the real market.

Cleveland — Price differentials between direct production and dealer machine shop turning and blast furnace grades seemed to be widening when the strike came. Direct production scrap in these grades was still holding up as lists of big generators sold last week went at ceiling prices. However dealer material seemed to be weakening. One local consumer turned down an offer of dealer machine shop turnings last week at \$30 per gross ton. Some small sales at this price were made. Dealer blast furnace grades were appraised at \$3 to \$5 per gross ton below the ceiling price with little or no buying.

St. Louis—Scrap men here shipped eagerly until the steel strike caught up with them. A steel mill bought a small tonnage of turnings and borings at \$2 below the ceiling price, but backed away from any further commitments for the present. Most of the mills were buying openhearth grades on a \$2 "springboard," basis.

Birmingham — Scrap was moving from dealers' yards to the mills on old orders before the strike but new orders were slow coming in. Brokers say Northern mills had been limiting distant purchases to avoid having a lot of cars in transit in the event of a steel strike. Blast furnace grades were still selling at ceiling prices, but mills cut down on the amount of freight costs they will absorb. The cast scrap market continued dull, with very few sales.

Cincinnati—Mills in the area had been fairly active before the strike and had been stepping up purchases of No. 1 and No. 2 heavy melting in an effort to build up inventories. No. 2 bundles went up by some but only on a limited basis. Most scrap bought was originating within the local basing point. No purchases of turnings below ceiling have been reported here.

Boston—Movement of cast scrap before the strike, seemed to have dropped to nothing. This was the basis for another price drop for cast. No. 2 steel remained at ceiling. Movement was fair.



Official Navy photo, released by Dept. of Defense

*It takes plenty of **SCRAP** ...to be ready for one!*

The historic "Big Mo" . . . a giant mass of armor-plate, stainless and other nickel-bearing steels . . . symbolizes the immense importance of these "fighting metals" to the nation's defense. For each powerful new warship for America's fleets, one-half the tonnage of needed steel must be made from scrap. Keeping this scrap moving to the mills is an industry-wide job . . . and our No. 1 specialty.

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Scrap Prices

Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS in CPR 5 and amendments. Shipping point and delivered prices calculated as shown below.)

GRADES	OPS No.	Basing Points															
		Pittsburgh	Johnstown	Butte	Butte	Midland	Monaca	Sharon	Youngstown	Canton	Warren	Cleveland	Buffalo	Chicago	Chicago	St. Louis	Detroit
No. 1 bundles	1	\$44.00	\$44.00	\$43.00	\$42.50	\$42.00	\$41.00	\$41.00	\$41.00	\$41.00	\$41.00	\$41.00	\$41.00	\$41.00	\$41.00	\$41.00	\$41.00
No. 1 busheling	2	44.00	44.00	43.00	42.50	42.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00
No. 1 heavy melting	3	43.00	43.00	42.00	41.50	41.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
No. 2 heavy melting	4	43.00	43.00	42.00	41.50	41.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
No. 2 bundles	5	43.00	43.00	42.00	41.50	41.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Machine shop turnings	6	34.00	34.00	33.00	32.50	32.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00
Mixed borings and turnings	7	38.00	38.00	37.00	36.50	36.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Shoveling turnings	8	38.00	38.00	37.00	36.50	36.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Cast iron borings	10	38.00	38.00	37.00	36.50	36.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
No. 1 chemical borings	26	41.00	41.00	40.00	39.50	39.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00
Forge crops	11	51.50	51.50	50.50	50.00	49.50	48.50	48.50	48.50	48.50	48.50	48.50	48.50	48.50	48.50	48.50	48.50
Bar crops and plate	12	49.00	49.00	48.00	47.50	47.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00
Punchings and plate	14	46.50	46.50	45.50	45.00	44.50	43.50	43.50	43.50	43.50	43.50	43.50	43.50	43.50	43.50	43.50	43.50
Electric furnace bundles	15	46.00	46.00	45.00	44.50	44.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
Cut struct., plate, 3 ft and less	16	47.00	47.00	46.00	45.50	45.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00
Cut struct., plate, 2 ft and less	17	49.00	49.00	48.00	47.50	47.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00
Cut struct., 1 ft and less	18	50.00	50.00	49.00	48.50	48.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00
Foundry steel, 2 ft and less	20	44.00	44.00	43.00	42.50	42.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00
Foundry steel, 1 ft and less	21	46.00	46.00	45.00	44.50	44.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
Heavy trimmings	24	43.00	43.00	42.00	41.50	41.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
No. 1 RR heavy melting	RR 1	48.00	48.00	45.00	44.50	44.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
Scrap rails, random lengths	RR 14	48.00	48.00	47.00	46.50	46.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Scrap rails, 3 ft and less	RR 16	51.00	51.00	50.00	49.50	49.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
Scrap rails, 2 ft and less	RR 17	52.00	52.00	51.00	50.50	50.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00
Scrap rails, 18 in. and less	RR 18	54.00	54.00	53.00	52.50	52.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
Rolling rails	RR 19	53.00	53.00	52.00	51.50	51.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Uncut tires	RR 20	48.00	48.00	47.00	46.50	46.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Cut tires	RR 21	51.00	51.00	50.00	49.50	49.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
Cut bolsters and side frames	RR 23	49.00	49.00	48.00	47.50	47.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00
RR specialties	RR 24, 28, 29	51.00	51.00	50.00	49.50	49.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
Solid steel axles	RR 25	58.00	58.00	57.00	56.50	56.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00
No. 3 steel wheels	RR 27	51.00	51.00	50.00	49.50	49.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
Unassorted	RR 35	40.00	40.00	39.00	38.50	38.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00	37.00

Cast Scrap Ceilings

Prices set by CPR 5, OPS

(F.o.b. all shipping points)

Grades	OPS No.	Price
Cupola cast	1	\$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron car wheels	9	47.00
Malleable	10	55.00
Drop broken mach'y cast	11	52.00

Ceiling price of clean cast iron foundry runoff or prepared cupola drops is 75 pct of corresponding grade.

Below-Ceiling Prices

PITTSBURGH (Delivered)

Drop broken mach'y cast	\$52.50 to \$58.00
Cupola cast	45.00 to 46.00
Charging box cast	47.00
Heavy breakable	45.50 to 46.00
Machine shop turnings	31.00
Mixed borings, turnings	35.00
Shoveling turnings	35.00
Cast iron borings	35.00

CHICAGO (Delivered)

Cupola cast	\$42.50 to \$43.50
Stove plate	36.00 to 38.00
Heavy breakable	38.00 to 39.00
Drop broken machinery	44.00 to 45.00
Unstripped motor blocks	33.00 to 35.00
Charging box cast	41.00 to 42.00
Clean auto cast	43.50 to 45.00
Malleable	52.00 to 53.00
Machine shop turnings	28.50 to 29.00
Mixed borings, turnings	33.00 to 34.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00

PHILADELPHIA (Delivered)

Cupola cast	\$38.00 to \$39.00
Heavy breakable	41.00 to 42.00
Clean auto cast	45.00 to 46.00
Unstripped motor blocks	34.00 to 35.00
Charging box cast	40.00 to 41.00

CLEVELAND (Delivered)

Machine shop turnings	\$29.00 to \$30.00
Mixed borings, turnings	33.00 to 35.00

Shoveling turnings	33.00 to 35.00
Cast iron borings	33.00 to 35.00
Unstripped motor blocks	38.00 to 39.00
Cupola cast	45.00 to 46.00
Heavy breakable	39.00 to 40.00
Drop broken machinery	51.00 to 52.00

BIRMINGHAM (Delivered)

Cupola cast	\$41.00 to \$42.00
Stove plate	39.00 to 40.00
Charging box cast	39.00 to 40.00
Heavy breakable	36.00 to 37.00
Drop broken machinery	42.00 to 43.00
Unstripped motor blocks	35.00 to 36.00

ST. LOUIS (Delivered)

Heavy breakable	\$45.00
Stove plate	42.00
Mixed borings, turnings	33.00

NEW YORK (Brokers' buying prices)

Drop broken machinery	\$36.00 to \$38.00
Mixed yard cast	34.00 to 35.00
Charging box cast	36.00 to 38.00
Heavy breakable	34.00 to 35.00
Unstripped motor blocks	30.00 to 31.00

BOSTON (Brokers' buying prices)

Cupola cast	\$33.00
Stove plate	33.00
Unstripped motor blocks	30.00
Heavy breakable	33.00

DETROIT (Brokers' buying prices)

Cupola cast	\$46.00
Charging box	45.00
Heavy breakable	43.00
Cast iron brake shoes	39.00
Stove plate	44.00
Unstripped motor blocks	40.00
Drop broken machinery cast	50.00
Machine shop turnings	25.00 to 26.00
Mixed boring and turnings	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00

CINCINNATI (Delivered)

Unstripped motor blocks	\$40.00
Stove plate	45.00
Clean auto cast	47.00

BUFFALO (F.o.b. shipping point)

Cupola cast	\$42.00
Drop broken mach'y cast	\$42.00 to 43.00
Machine shop turnings	26.00 to 27.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00

SAN FRANCISCO (Delivered)

Cupola cast	\$42.00
No. 2 bundles	39.00
Machine shop turnings	30.00
Shoveling turnings	25.00
Cast iron borings	25.00

LOS ANGELES (Delivered)

Cupola cast	\$46.00
No. 2 bundles	39.00
Machine shop turnings	30.00
Shoveling turnings	25.00
Cast iron borings	25.00

SEATTLE (Delivered)

Cupola cast	\$36.00
Heavy breakable	32.00
No. 2 bundles	39.00
Machine shop turnings	30.00
Shoveling turnings	25.00
Cast iron borings	25.00

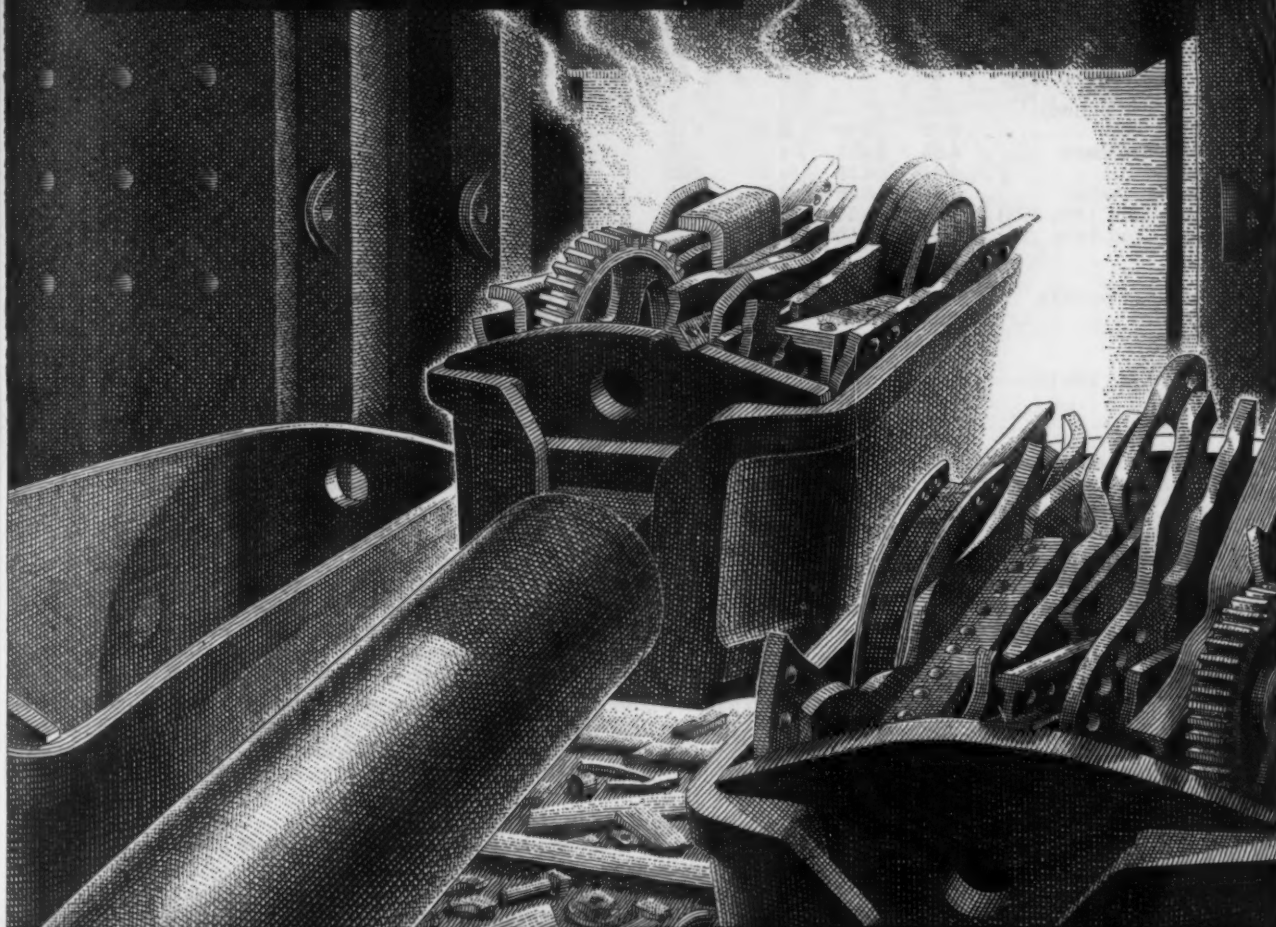
SHIPPING POINT PRICES (Except RR scrap)
—for shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for the shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is \$1.25 per gross ton except: Memphis, \$1.40; Great Lakes ports, \$1.50; and New England ports, \$1.75. Maximum shipping point price on No. 1 bundles (prime grade) in New York City is \$36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point.

Hamilton, Ontario

(Consumers buying prices, del'd gross ton)	
Hvy. melting steel	\$35.00
No. 1 bundles	35.00
No. 2 bundles	34.50
Mechanical bundles	31.00
Mixed, steel scrap	35.00
Rails, remelting	31.00
Rails, re-rolling	30.00
Bushellings	33.00
Bushellings, prepared new factory	33.00
Bushellings, unprepared new factory	32.00
Short steel turnings	32.00
Mixed borings, turnings	32.00
Cast scrap	50.00

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The facilities and experienced personnel in each of our offices, stand ready to supply your every scrap requirement whenever and wherever needed.



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Oliver Building
PUEBLO, COLORADO
334 Colorado Bldg.
READING, PENNA.
Luria Building

SAN FRANCISCO, CALIFORNIA
Pacific Gas & Elec. Co. Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(cents per pound)				
Hot-rolled sheets	3.60	3.60	3.60	3.60
Cold-rolled sheets	4.35	4.35	4.35	4.35
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.80
Hot-rolled strip	3.50	3.50	3.50	3.50
Cold-rolled strip	4.75	4.75	4.75	4.75
Plate	3.70	3.70	3.70	3.70
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	36.50

Tin and Terneplate:	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(dollars per base box)				
Tinplate (1.50 lb.) cokes	\$8.70	\$8.70	\$8.70	\$8.70
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	7.40
Special coated mfg. ternes	7.50	7.50	7.50	7.50

Bars and Shapes:	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(cents per pound)				
Merchant bars	3.70	3.70	3.70	3.70
Cold finished bars	4.55	4.55	4.55	4.55
Alloy bars	4.30	4.30	4.30	4.30
Structural shapes	3.65	3.65	3.65	3.65
Stainless bars (No. 302)	31.50	31.50	31.50	31.25
Wrought iron bars	9.50	9.50	9.50	9.50

Wire	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(cents per pound)				
Bright wire	4.85	4.85	4.85	4.85

Rails	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(dollars per 100 lb)				
Heavy rails	\$3.60	\$3.60	\$3.60	\$3.60
Light rails	4.00	4.00	4.00	4.00

Semifinished Steel:	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(dollars per net ton)				
Rerolling billets	\$56.00	\$56.00	\$56.00	\$56.00
Slabs, rerolling	56.00	56.00	56.00	56.00
Forging billets	66.00	66.00	66.00	66.00
Alloy blooms, billets, slabs	70.00	70.00	10.00	70.00

Wire Rod and Skelp:	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(cents per pound)				
Wire rods	4.10	4.10	4.10	4.10
Skelp	3.35	3.35	3.35	3.35

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron:	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(per gross ton)				
Foundry, del'd. Phila.	\$58.19	\$58.19	\$58.19	\$57.77
Foundry, Valley	52.50	52.50	52.50	52.50
Foundry, Southern, Cin'ti	55.58	55.58	55.58	55.58
Foundry, Birmingham	48.88	48.88	48.88	48.88
Foundry, Chicago	52.50	52.50	52.50	52.50
Basic, del'd. Philadelphia	57.27	57.27	57.27	56.92
Basic, Valley furnace	52.00	52.00	52.00	52.00
Malleable, Chicago	52.50	52.50	52.50	52.50
Malleable, Valley	52.50	52.50	52.50	52.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese	186.25	186.25	186.25	186.25

†The switching charges for delivery to foundries in the Chicago district is \$1 per ton.
‡Average of U. S. prices quoted on Ferroalloy pages.

Scrap:	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(per gross ton)				
No. 1 steel, Pittsburgh	\$43.00*	\$43.00*	\$43.00*	\$44.00*
No. 1 steel, Phila. area	41.50*	41.50*	41.50*	42.50*
No. 1 steel, Chicago	41.50*	41.50*	41.50*	42.50*
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	41.15*
Low phos., Young'n.	46.50*	46.50*	46.50*	46.50*
No. 1 cast, Pittsburgh	45.50†	45.50†	45.50†	49.00†
No. 1 cast, Philadelphia	38.50†	40.50†	44.50†	49.00†
No. 1 cast, Chicago	43.00†	43.50†	44.00†	49.00†

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.
‡Del'd., includes broker's fee.

Coke: Connellsville:	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(per net ton at oven)				
Furnace coke, prompt	\$14.75	\$14.75	\$14.75	\$14.75
Foundry coke, prompt	17.75	17.75	17.75	17.75

Nonferrous Metals:	June 3, 1952	May 27, 1952	May 6, 1952	June 5, 1951
(cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	\$1.215	\$1.215	\$1.215	\$1.36
Zinc, East St. Louis	17.50	19.50	19.50	17.50
Lead, St. Louis	14.80	14.80	16.80	16.80
Aluminum, virgin	19.00	19.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	59.58
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	39.00	39.00	44.00	42.00

[Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Composite Prices

Finished Steel Base Price	June 3, 1952
.....4.131¢ per lb.	
One week ago.....4.131¢ per lb.	
One month ago.....4.131¢ per lb.	
One year ago.....4.131¢ per lb.	

High	Low
1952.... 4.131¢ Jan. 1	4.131¢ Jan. 1
1951.... 4.131¢ Jan. 2	4.131¢ Jan. 2
1950.... 4.131¢ Dec. 1	3.837¢ Jan. 3
1949.... 3.837¢ Dec. 27	3.705¢ May 3
1948.... 3.721¢ July 27	3.193¢ Jan. 1
1947.... 3.193¢ July 29	2.848¢ Jan. 1
1946.... 2.848¢ Dec. 31	2.464¢ Jan. 1
1945.... 2.464¢ May 29	2.396¢ Jan. 1
1944.... 2.396¢	2.396¢
1943.... 2.396¢	2.396¢
1942.... 2.396¢	2.396¢
1941.... 2.396¢	2.396¢
1940.... 2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939.... 2.35367¢ Jan. 3	2.27207¢ May 16
1938.... 2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937.... 2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936.... 2.32263¢ Dec. 28	2.05200¢ Mar. 10
1929.... 2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Pig Iron	June 3, 1952
.....\$52.77 per gross ton	
.....52.77 per gross ton	
.....52.77 per gross ton	
.....52.69 per gross ton	

High	Low
\$52.77 May 2	\$52.72 Jan. 1
52.72 Oct. 9	52.69 Jan. 2
52.69 Dec. 12	45.88 Jan. 3
46.87 Jan. 18	45.88 Sept. 6
46.91 Oct. 12	39.58 Jan. 6
37.98 Dec. 30	30.14 Jan. 7
30.14 Dec. 10	25.37 Jan. 1
25.37 Oct. 23	23.61 Jan. 2
\$23.61	\$23.61
23.61	23.61
23.61	23.61
\$23.61 Mar. 20	\$23.45 Jan. 2
23.45 Dec. 23	22.61 Jan. 2
22.61 Sept. 19	20.61 Sept. 12
23.25 June 21	19.61 July 6
32.25 Mar. 9	20.25 Feb. 16
19.74 Nov. 24	18.73 Aug. 11
18.71 May 14	18.21 Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel	June 3, 1952
.....\$42.00 per gross ton	
.....42.00 per gross ton	
.....42.00 per gross ton	
.....43.00 per gross ton	

High	Low
\$42.00 Jan. 1	\$42.00 Jan. 1
47.75 Jan. 30	42.00 Oct. 23
45.13 Dec. 19	26.25 Jan. 3
43.00 Jan. 4	19.33 June 28
43.16 July 27	39.75 Mar. 9
42.58 Oct. 28	29.50 May 20
31.17 Dec. 24	19.17 Jan. 1
19.17 Jan. 2	18.92 May 22
19.17 Jan. 11	15.76 Oct. 24
\$19.17	\$19.17
19.17	19.17
\$22.00 Jan. 7	18.92 May 22
21.83 Dec. 30	16.04 Apr. 9
22.50 Oct. 3	14.08 May 16
15.00 Nov. 22	11.00 June 7
21.92 Mar. 30	12.67 June 9
17.75 Dec. 21	12.67 June 8
17.58 Jan. 29	14.08 Dec. 8

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Heavy
June 5,
1951
\$57.77
62.50
55.58
48.88
52.50
56.92
62.00
52.50
70.55
186.25
the Cal.

\$44.00*
42.50*
42.50*
41.15*
46.50*
49.00†
49.00†
49.00†

\$14.75
17.75

24.50
24.625
\$1.36
17.50
16.80
19.00
59.58
24.50
42.00

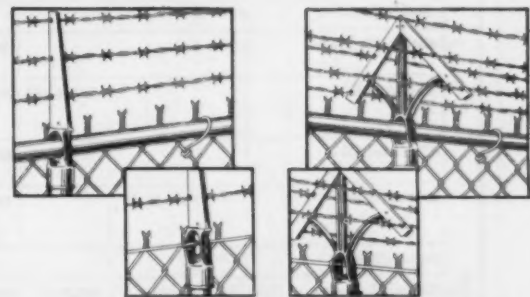
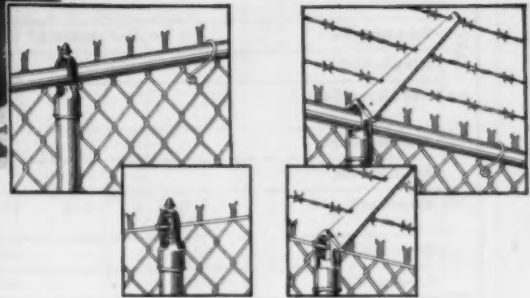
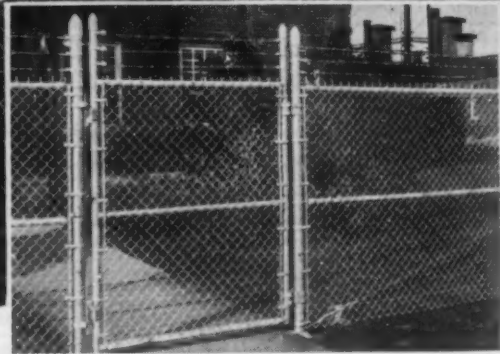
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IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.													
STEEL PRICES	INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL-ING	SHAPES STRUCTURALS		STRIP					
	Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Steel Sheet	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy		
EAST	Bethlehem, Pa.				\$70.00 B3			3.70 B3	5.50 B3						
	Buffalo, N. Y.			\$56.00 B3	\$66.00 B3, R3	\$70.00 B3, R3	4.45 B3	3.70 B3	5.50 B3	3.50 B3, R3	4.65 B3	4.95 B3	6.40 B3		
	Claymont, Del.														
	Coatesville, Pa.														
	Conschoecken, Pa.				\$73.00 A2	\$77.00 A2				3.90 A2		5.55 A2	4.00 A2		
	Harrisburg, Pa.														
	Hartford, Conn.														
	Johnstown, Pa.			\$56.00 B3	\$66.00 B3	\$70.00 B3		3.70 B3	5.50 B3	3.50 B3					
	Newark, N. J.														
	New Haven, Conn.										5.15 A5 5.85 D1				
	Phoenixville, Pa.							5.90 P2							
	Putnam, Conn.														
	Sparrows Pt., Md.									3.50 B3	4.65 B3	4.95 A5, B3	6.40 B3		
	Worcester, Mass.														
MIDDLE WEST	Trenton, N. J.										6.00 R4				
	Alton, Ill.									3.95 L1					
	Ashland, Ky.									3.50 A7			3.60 A7		
	Canton-Massillon				\$66.00 R3	\$70.00 R3 \$66.00 T5									
	Chicago, Ill.			\$56.00 U1	\$66.00 U1, R3, W8	\$70.00 U1, R3, W8	4.45 U1	3.65 U1, W8	5.50 U1	3.50 A1, W8	4.90 A1, I3		3.60 W8		
	Cleveland, Ohio				\$66.00 R3						4.65 A5, J3	6.55 A5 6.70 J3	3.60 R3, J3		
	Detroit, Mich.		\$54.00 R5		\$69.00 R5	\$73.00 R5				4.40 M2 3.80 G3	4.85 G3 5.45 M2 5.60 R5, D1	5.95 G3	3.80 G3 4.40 M3		
	Duluth, Minn.														
	Gary, Ind. Harbor, Indiana			\$56.00 U1	\$66.00 U1	\$70.00 U1, Y1	4.45 I3	3.65 U1, I3	5.50 U1, I3 6.00 Y1	3.50 U1, Y1, I3	4.90 I3	5.30 U1, I3 5.80 Y1	3.60 U1, Y1, I3		
	Granite City, Ill.												4.30 G2		
	Kokomo, Ind.														
	Middletown, Ohio										4.65 A7				
	Niles, Ohio Sharon, Pa.									4.00 S1	5.35 S1	5.40 S1	6.55 S1		
	WEST	Pittsburgh, Pa.	\$52.00 U1	\$54.00 U1, C11	\$56.00 U1	\$66.00 U1	\$70.00 U1, C11	3.35 U1 3.45 J3	4.45 U1	3.65 U1, J3	5.50 U1, J3	4.00 S9, S7 3.75 A3 3.50 J3, A7	4.65 J3, A7 5.00 A3 5.35 B4, S7	3.60 U1, J3, A7 3.75 A3	
Portsmouth, Ohio															
Weirton, Wheeling, Follansbee, W. Va.								3.90 W3		3.60 W3	4.65 W3, F3	5.75 W3	7.20 W3		
Youngstown, Ohio						\$70.00 Y1, C10	3.35 U1, R3			6.00 Y1	3.50 U1, R3, Y1	4.65 R3, Y1 5.25 C5, T4 5.35 B4	5.30 U1, R3 5.80 Y1		
Fontana, Cal.		\$79.00 K1	\$80.00 K1	\$75.00 K1	\$85.00 K1	\$89.00 K1			4.25 K1	6.10 K1	4.75 K1	6.30 K1	6.20 K1		
Geneva, Utah					\$66.00 C7				3.65 C7	5.50 C7					
Kansas City, Mo.									4.25 S2		4.10 S2				
Los Angeles, Calif.					\$85.00 B2	\$90.00 B2			4.25 B2, C7	6.05 B2	4.25 B2, C7	6.40 C1	6.05 B2		
Minnequa, Colo.									4.10 C6		4.55 C6				
San Francisco, Cal.					\$85.00 B2				4.20 B2	6.00 B2	4.25 C7, B2		6.05 B2		
SOUTH	Seattle, Wash.	\$73.00 S11			\$85.00 B2				4.30 B2	6.10 B2	4.50 B2		6.30 B2		
	Atlanta, Ga.										4.05 A8				
	Birmingham, Ala. Alabama City, Ala.			\$56.00 T2	\$66.00 T2				3.65 R3, T2	5.50 T2	3.50 R3, T2		5.30 T2		
	Houston, Texas		\$62.00 S2		\$74.00 S2	\$78.00 S2			4.05 S2		3.90 S2				

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
Hot-rolled 18 ga. & heavy	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
3.60 B3	4.35 B3				5.40 B3	6.55 B3			4.10 W6			
										† Special coated mig turners deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb, deduct \$2.20 from 1.25-lb coke base box. * COKES: 1.50-lb, add 25¢. ELECTRO: 0.50-lb, add 25¢; 0.75-lb, add 65¢.		
4.00 A2					5.45 A2							
									4.10 B3			
3.60 B3	4.35 B3	4.80 B3			5.40 B3	6.55 B3	6.75 B3		4.20 B3	\$8.55 B3	\$7.25 B3	
									4.40 A5			
									4.20 R4			
									4.40 L1			
3.60 A7		4.80 A7	4.65 A7									
		4.80 R3										
3.60 W3					5.40 U1				4.10 A5, R3, N4			
3.60 R3, J3	4.35 R3, J3		4.65 R3		5.40 R3, J3	6.55 R3, J3			4.10 A5			
3.80 G3 4.40 M3	4.55 G3				5.95 G3	7.10 G3						
3.60 U1, Y1, I3	4.35 U1, Y1, I3	4.80 U1, I3	4.65 U1, I3	5.20 U1	5.40 U1, I3 5.90 Y1	6.55 U1, I3 7.05 Y1		5.40 I3	4.10 Y1	\$8.45 B3, U1, Y1	\$7.15 U1, I3	5.85 U1 5.30 Y1
4.30 G2	5.05 G2	5.50 G2	5.35 G2								\$7.35 G2	6.05 G2
		5.20 C9										
	4.35 A7		4.65 A7	5.20 A7								
5.25 N3 4.00 S1		6.00 N3		6.00 N3	5.40 S1							
3.60 U1, J3, A7 3.75 A3	4.35 U1, J3, A7	4.80 U1	4.65 U1		5.40 U1, J3	6.55 U1, J3	7.20 U1		4.10 A5 4.30 P6	\$8.45 U1, J3	\$7.15 U1, J3	5.85 U1
									4.30 P7			
3.60 W3, W5	5.35 F3 4.35 W3, W5	4.80 W3, W5		5.20 W3, W5	5.75 W3	6.90 W3				\$8.45 W3, W5	\$7.15 W3, W5	6.15 W5 5.85 F3
3.60 U1, R3, Y1	4.35 R3, Y1	5.50 R1	4.65 Y1	6.05 E2	5.40 U1, R3 5.90 Y1	6.55 R3 7.05 Y1		6.05 R1, E2	4.10 Y1	\$8.45 R3	\$7.15 R3	
4.55 K1	5.30 K1				6.35 K1	7.50 K1			4.90 K1			
3.70 C7												
4.30 C7		5.55 C7						5.40 C7	4.90 B2, C7	\$9.20 C7	\$7.90 C7	
									4.35 C6			
4.30 C7	5.30 C7	5.55 C7										
3.60 R3, T2	4.35 T2	4.80 R3, T2			5.40 T2			4.75 R3	4.10 R3, T2	\$8.55 T2	\$7.25 T2	
									4.50 S2			

Bethlehem, Pa.
Buffalo, N. Y.
Claymont, Del.
Coatesville, Pa.
Conshohocken, Pa.
Harrisburg, Pa.
Hartford, Conn.
Johnstown, Pa.
Newark, N. J.
New Haven, Conn.
Phoenixville, Pa.
Putnam, Conn.
Sparrows Pt., Md.
Worcester, Mass.
Trenton, N. J.
Alton, Ill.
Ashland, Ky.
Canton-Massillon
Chicago, Ill.
Cleveland, Ohio
Detroit, Mich.
Duluth, Minn.
Gary, Ind. Harbor,
Indiana
Granite City, Ill.
Kokomo, Ind.
Middletown, Ohio
Niles, Ohio
Sharon, Pa.
Pittsburgh, Pa.
Portsmouth, Ohio
Weirton, Wheeling,
Follansbee, W. Va.
Youngstown, Ohio
Fontana, Cal.
Geneva, Utah
Kansas City, Mo.
Los Angeles, Cal.
Minnequa, Colo.
San Francisco, Cal.
Seattle, Wash.
Atlanta, Ga.
Birmingham, Ala.
Alabama City, Ala.
Houston, Texas

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.										
STEEL PRICES		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Milg's Bright
EAST	Bethlehem, Pa.				4.30 B3	5.40 B3	5.55 B3					
	Buffalo, N. Y.	3.70 B3,R3	3.70 B3,R3	4.60 B5	4.40 B3,R3	5.40 B3	5.55 B3	3.70 B3				4.85 W6
	Claymont, Del.							4.15 C4		4.85 C4		
	Coatesville, Pa.							4.15 L4		5.25 L4		
	Conschohocken, Pa.							4.15 A2	4.75 A2	5.05 A2	5.90 A2	
	Harrisburg, Pa.							6.30 C3	6.30 C3			
	Hartford, Conn.			5.10 R3		5.85 R3						
	Johnstown, Pa.	3.70 B3	3.70 B3		4.30 B3		5.55 B3	3.70 B3		4.75 B3	5.65 B3	4.85 B3
	Newark, N. J.			5.00 W10		5.75 W10						
	New Haven, Conn.											
	Phoenixville, Pa.											
	Putnam, Conn.			5.10 W10								
	Sparrows Point, Md.		3.70 B3					3.70 B3		4.75 B3	5.65 B3	4.95 B3
MIDDLE WEST	Worcester, Mass.					5.75 A5						5.15 A5,W6
	Trenton, N. J.											
	Alton, Ill.	4.15 L1										5.05 L1
	Ashland, Ky.							3.70 A7				
	Canton-Massillon	3.70 R3		4.55 R3,R2	3.95 T5 4.30 R3	4.90 T5 5.40 R3,R2						
	Chicago, Ill.	3.70 U1, R3, W8	3.70 R3	4.55 A5,B5, W8,W1	4.30 U1,R3 W8	5.40 R3,W8 W10,B5,L2 5.45 A5		3.70 U1,W8	4.75 U1	4.75 U1	5.65 U1	5.10 W7 4.85 R3,A5, K2,N4
	Cleveland, Ohio	3.70 R3	3.70 R3	4.55 A5,C13		5.45 A5	5.55 R3,J3	3.70 R3,J3	4.75 J3		5.65 R3,J3	4.85 A5,C13
	Detroit, Mich.	3.85 R5		4.70 P8,R5 4.80 P3	4.45 R5 4.65 G3	5.50 R5 5.55 P8 5.60 P3						
	Duluth, Minn.											4.85 A5
	Gary Ind. Harbor Indiana	3.70 U1, Y1, I3	3.70 U1,I3, Y1	4.55 R3,M5, L2	4.30 U1,I3, Y1	5.40 R3,M5, L2	5.55 U1,I3 6.05 Y1	3.70 U1,I3, Y1	4.75 I3	4.75 U1	5.65 U1,I3 6.15 Y1	5.10 M4
	Granite City, Ill.							4.40 G2				
	Kokomo, Ind.											4.95 C3
	WEST	Middletown, Ohio										
Niles, Ohio Sharon, Pa.								3.95 S1		5.20 S1	5.70 S1	
Pittsburgh, Pa.		3.70 U1,J3	3.70 U1,J3	4.55 R3,A5, J3,S8,W10, C8	4.30 U1,C11	5.40 C11,S8, W10,C8,A5	5.55 U1,J5	3.70 U1,J3	4.75 U1	4.75 U1	5.65 U1,J3	4.85 A5,J3 5.10 P6
Portsmouth, Ohio												5.25 P7
Weirton, Wheeling, Follansbee, W. Va.		3.85 W3						4.00 W3,W5				
Youngstown, Ohio		3.70 U1, R3, Y1	3.70 U1,R3, Y1	4.55 Y1,F2	4.30 U1, Y1, C10	5.40 Y1,C10, F2	5.55 U1 6.05 Y1	3.70 U1, R3, Y1			5.65 R3 6.15 Y1	4.85 Y1
Fontana, Cal.		4.40 K1	4.40 K1		5.35 K1		6.60 K1	4.30 K1		5.70 K1	6.25 K1	
Geneva, Utah								3.70 C7			5.65 C7	
Kansas City, Mo.		4.30 S2	4.30 S2		4.90 S2							5.45 S2
Los Angeles, Cal.		4.40 C7,B2	4.40 C7,B2		5.35 B2		6.25 B2					5.00 C7,B2
Minnequa, Colo.		4.15 C6	4.50 C6					4.50 C6				5.10 C6
San Francisco, Cal.		4.45 B2 4.40 C7	4.45 B2 4.40 C7				6.30 B2					5.00 C7
Seattle, Wash.		4.45 B2	4.45 B2				6.30 B2	4.60 B2			6.55 B2	
SOUTH	Atlanta, Ga.	4.25 A8	4.25 A8									5.10 A8
	Birmingham, Ala. Alabama City, Ala.	3.70 R3,T2	3.70 R3,T2				5.55 T2	3.70 R3,T2			5.65 T2	4.85 R3,T2
	Houston, Tex.	4.10 S2	4.10 S2		4.70 S2			4.10 S2				5.25 S2

Key to Steel Producers

With Principal Offices

A1	Acme Steel Co., Chicago
A2	Alun Wood Steel Co., Conshohocken, Pa.
A3	Allegheny Ludlum Steel Corp., Pittsburgh
A4	American Clad Metals Co., Carnegie, Pa.
A5	American Steel & Wire Div., Cleveland
A6	Angell Nail & Chaplet Co., Cleveland
A7	Armco Steel Corp., Middletown, O.
A8	Atlantic Steel Co., Atlanta, Ga.
B1	Babcock & Wilcox Tube Co., Beaver Falls, Pa.
B2	Bethlehem Pacific Coast Steel Corp., San Francisco
B3	Bethlehem Steel Co., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin Inc., Harvey, Ill.
C1	California Cold Rolled Steel Corp., Los Angeles
C2	Carpenter Steel Co., Reading, Pa.
C3	Central Iron & Steel Co., Harrisburg, Pa.
C4	Claymont Steel Corp., Claymont, Del.
C5	Cold Metal Products Co., Youngstown
C6	Colorado Fuel & Iron Corp., Denver
C7	Columbia-Geneva Steel Div., San Francisco
C8	Columbia Steel & Shifting Co., Pittsburgh
C9	Continental Steel Corp., Kokomo, Ind.
C10	Copperweld Steel Co., Glassport, Pa.
C11	Crucible Steel Co. of America, New York
C12	Cumberland Steel Co., Cumberland, Md.
C13	Cuyahoga Steel & Wire Co., Cleveland
D1	Detroit Steel Corp., Detroit
D2	Detroit Tube & Steel Div., Detroit
D3	Driver Harris Co., Harrison, N. J.
E1	Eastern Stainless Steel Corp., Baltimore
E2	Empire Steel Co., Mansfield, O.
F1	Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
F2	Fitzsimmons Steel Corp., Youngstown
F3	Follansbee Steel Corp., Follansbee, W. Va.
G1	Globe Iron Co., Jackson, O.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Corp., Detroit
H1	Hanna Furnace Corp., Detroit
I1	Ingersoll Steel Div., Chicago
I2	Inland Steel Co., Chicago
I3	Interlake Iron Corp., Cleveland
J1	Jackson Iron & Steel Co., Jackson, O.
J2	Jesop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
K1	Kaiser Corp., Oakland, Cal.
K2	Keystone Steel & Wire Co., Peoria
K3	Koppers Co., Granite City, Ill.
L1	Laclede Steel Co., St. Louis
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
M1	Mahoning Valley Steel Co., Niles, O.
M2	McLouth Steel Corp., Detroit
M3	Mercer Tube & Mfg. Co., Sharon, Pa.
M4	Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5	Monarch Steel Co., Inc., Hammond, Ind.
M6	Mytic Iron Works, Everett, Mass.
N1	National Supply Co., Pittsburgh
N2	National Tube Co., Pittsburgh
N3	Niles Rolling Mills Co., Niles, O.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
O1	Oliver Iron & Steel Co., Pittsburgh
P1	Page Steel & Wire Div., Monessen, Pa.
P2	Phoenix Iron & Steel Co., Phoenixville, Pa.
P3	Pilgrim Drawn Steel Div., Plymouth, Mich.
P4	Pittsburgh Coke & Chemical Co., Pittsburgh
P5	Pittsburgh Screw & Bolt Co., Pittsburgh
P6	Pittsburgh Steel Co., Pittsburgh
P7	Portsmouth Div., Detroit Steel Corp., Detroit
P8	Plymouth Steel Co., Detroit
R1	Reeves Steel & Mfg. Co., Dover, O.
R2	Reliance Div., Eaton Mfg. Co., Massillon, O.
R3	Republic Steel Corp., Cleveland
R4	Roebbing Sons Co. (John A.), Trenton, N. J.
R5	Rotary Electric Steel Co., Detroit
S1	Sharon Steel Corp., Sharon, Pa.
S2	Sheffield Steel Corp., Kansas City
S3	Shenango Furnace Co., Pittsburgh
S4	Simonds Saw & Steel Co., Fitchburg, Mass.
S5	Sloss Sheffield Steel & Iron Co., Birmingham
S6	Standard Forging Corp., Chicago
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S9	Superior Steel Corp., Carnegie, Pa.
S10	Sweet's Steel Co., Williamsport, Pa.
T1	Tonawanda Iron Div., N. Tonawanda, N. Y.
T2	Tennessee Coal, Iron & R. R. Co., Birmingham
T3	Tennessee Products & Chem. Corp., Nashville
T4	Thomas Steel Co., Warren, O.
T5	Timken Steel & Tube Div., Canton, O.
T6	Tremont Nail Co., Wareham, Mass.
U1	United States Steel Co., Pittsburgh
U2	Universal-Cyclops Steel Corp., Bridgeville, Pa.
W1	Wallingford Steel Co., Wallingford, Conn.
W2	Washington Steel Corp., Washington, Pa.
W3	Weirton Steel Co., Weirton, W. Va.
W4	Wheatland Tube Co., Wheatland, Pa.
W5	Wheeling Steel Corp., Wheeling, W. Va.
W6	Wickwire Spencer Steel Co., Buffalo
W7	Wilson Steel & Wire Co., Chicago
W8	Wisconsin Steel Co., S. Chicago, Ill.
W9	Woodward Iron Co., Woodward, Ala.
W10	Wycoff Steel Co., Pittsburgh
Y1	Youngstown Sheet & Tube Co., Youngstown

Steel Prices

WARE-HOUSES		Cities											
		Sheets			Strip		Plates Shapes		Bars		Alloy Bars		
		Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.54	6.80	8.20	6.03			6.13	6.13	6.01	6.63			
Birmingham*	6.44	7.05											
Boston	5.59	6.37	7.20	5.54			5.85	5.70	5.52	7.60			
Buffalo	6.25	7.03	8.48	6.15	7.74		6.38	6.20	6.05	6.61	10.25	10.55	11.95
Chicago	5.50	6.28	8.20	5.86			6.43	6.25	6.16	6.92	10.30	10.63	12.25
Cincinnati*	5.54	6.32	8.26	5.49			5.89	5.80	5.52	6.18	10.15	10.52	12.17
Cleveland	5.54	6.32	7.85	5.49			5.65	5.65	5.47	6.05	10.10	10.52	11.75
Detroit	5.87	6.39	8.32	5.79			6.17	6.12	5.77	6.66	10.52	11.17	12.17
Houston	5.54	6.32	7.96	5.45			5.82	5.95	5.77	6.15	10.21	11.86	12.12
Indianapolis, del'd	5.74	6.49	8.55	5.78			5.95	5.98	5.95	6.40	10.37	11.25	12.90
Kansas City	6.35	7.37	8.57	6.15			6.30	6.32	6.38	8.38	10.95	11.40	12.62
Los Angeles	6.58	8.09					6.42	6.35	6.83	11.25	11.50	12.90	
Memphis*	5.94	6.72	8.25	5.89			6.10	6.05	5.87	6.80	10.50	11.80	13.50
Milwaukee	6.22	7.64	8.66	6.10	7.81		6.38	6.43	6.20	7.01	10.10	11.50	11.80
New Orleans*	6.40	7.68	8.70	6.90			6.74	6.48	6.77	7.22	11.30	11.30	13.05
New York*	6.30	8.10	9.30	6.40	10.45		6.30	6.30	6.25	8.15	11.30	11.30	13.50
Norfolk	6.25	7.03	7.51	6.20			6.36	6.36	6.33	7.11			
Philadelphia*	5.71	6.48	8.02	5.66			5.81	5.82	5.64	6.31	10.17	11.88	12.12
Pittsburgh	5.98	7.01	8.26	5.93			5.87	6.09	5.91	7.02	10.75	12.10	12.40
Portland	6.09	6.90	8.27	6.36	7.67		6.46	6.08	6.22	7.03	10.45	10.49	12.14
San Francisco*	6.52	6.91	8.45	7.19			6.88	6.40	6.42	7.29	10.75	10.75	12.40
Seattle	6.68			6.33			6.20	6.20	5.95	7.30			
St. Louis	5.79	6.72	8.10	6.04	7.15		6.05	5.84	6.02	6.91	9.82	10.23	11.82
St. Paul*	6.07	7.22	8.38	6.08			6.19	6.09	6.27	7.16	10.17	10.47	12.12
	5.54	6.32	7.85	5.59			5.65	5.65	5.47	6.15	10.10	10.10	11.75
	7.25	8.70	9.10	7.30			6.80	7.17	7.00	8.65			
	7.95		9.00	8.00			7.45	7.60	7.95				
	6.51	7.88	9.10	6.44	10.45		6.38	6.25	6.34	8.15	11.30	11.30	13.05
	6.59	8.23	9.25	6.45			6.50	6.45	6.45	8.20			
	6.14	7.84	9.55	7.35			6.75	6.37	6.60	8.80			
	6.81	8.98	7.40				6.78	6.70	6.80	8.94			
	5.73	6.62	8.15	5.77	7.66		6.02	6.05	5.77	6.43	10.08	10.40	11.73
	5.84	7.15	5.79	8.15	6.10		6.22	5.80	6.70				
	6.14	6.92	8.45	6.09			6.25	6.25	6.07	6.75			

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

EXCEPTIONS: (1) 500 to 1499 lb.

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingot, rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs, billets, rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets, forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.25	32.50	30.25	46.75	37.00	41.25	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2; (type 316 add 4.5¢) J2; Baltimore, Md., E1; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U2; New Castle, Ind., J2; Ft. Wayne, Ind., J4; Lockport, N. Y., R4.
Strip: Midland, Pa., C11; Cleveland, A3; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; (type 316 add 4.5¢) W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, Md., C2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, Pa., C5; Lockport, N. Y., S4; Sharon, Pa., S1 (type 301 add ¼¢); Butler, Pa., A7; Wallingford, Conn., W1.
Bars: Baltimore, Md., U1; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1; F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, Ill., U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, Ind., A3; Lockport, N. Y., S4; Canton, O., T5; Ft. Wayne, Ind., J4.
Wire: Waukegan, Ind., A3; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind., J4; Harrison, N. J., D3; Baltimore, Md., A7; Dunkirk, N. Y., A3; Monessen, Pa., F1; Syracuse, N. Y., C11; Bridgeville, Pa., U2.
Structurals: Baltimore, Md., A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, N. Y., C11.
Plates: Brackenridge, Pa., A3 (type 416 add ¼¢); Butler, Pa., A7; Chicago, Ill., U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., J2; Lockport, N. Y., S4; Middletown, O., A7; Washington, Pa., J2; Cleveland, Massillon, R3.
Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, N. Y., C11; Ferndale, Mich., A3; Washington, Pa., J2.
Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11.
ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 series.
WASHINGTON STEEL—Slightly lower on 300 series except where noted.

Miscellaneous Prices

PIPE AND TUBING

Base discounts, f.a.b. mills. Base price about \$200 per net ton.

	BUTTWELD												SEAMLESS					
	1/2 In.			3/4 In.			1 In.			1 1/2 In.			2 In.			2 1/2 In.		
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
STANDARD																		
T. & C.																		
Sparrows Pt. B3...	34.0	12.0	37.0	16.0	39.0	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0				
Cleveland R3...	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0				
Oakland K1...	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0				
Pittsburgh J3...	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5
Pittsburgh N2...	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5
Alton, Ill. L1...	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0				
Sharon M3...	36.0	13.0	39.0	17.0	41.5	21.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0				
Pittsburgh N1...	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5		32.5	34.5
Wheeling W5...	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0				
Wheeling W4...	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5				
Youngstown Y1...	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5
EXTRA STRONG,																		
PLAIN ENDS																		
Sparrows Pt. B3...	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0				
Cleveland R3...	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0				
Oakland K1...	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0				
Pittsburgh J3...	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0
Pittsburgh N2...	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0
Alton, Ill. L1...	32.5	12.0	36.5	16.0	38.5	19.5	39.0	20.0	39.5	21.0	40.0	21.5	40.5	22.0				
Sharon M3...	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0				
Pittsburgh N1...	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0		33.0	36.5
Wheeling W5...	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0				
Wheeling W4...	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5				
Youngstown Y1...	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0

Galvanized discounts based on zinc, at 17¢ per lb. East St. Louis. For each 1 lb. change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/2 in., 2 in., 3/4 pt.; 2 1/2 in., 3 in., 3/4 pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.5¢ to 17.5¢ per lb., use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only, butt-weld and seamless, 1 pt. higher discount. Plain ends, butt-weld and seamless, 3 in. and under, 3/4 pt. higher discount. Butt-weld jobbers' discount, 5 pct. East St. Louis zinc price now 19.50¢.

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$14.50 to \$15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$17.50 to \$18.00
Foundry, oven coke	
Buffalo, del'd	\$26.69
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

ELECTRICAL SHEETS

22 Ga. H-R cut length	Armature	Ele.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
F.a.b. Mill Cents Per Lb.							
Beech Bottom W5...	7.25	8.50	9.30	9.85	10.40	11.10	
Brackenridge A3...	7.25	8.50	9.30	9.85			
Granite City G3...	7.95	9.20					
Ind. Harbor B3...	6.75	7.25					
Mannfield E2...	7.25	7.75	9.00	9.80			
Niles, O. N3...	7.05	7.55					
Vandergrift U1...	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O. R3...	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville A7...	6.75	7.25	8.50	9.30	9.85	10.40	11.10

FIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery	Low Phos. Charcoal
Bethlehem B3...	54.00	54.50	55.00	55.50			
Birmingham B3...	48.38	48.88					
Birmingham H9...	48.38	48.88					
Birmingham S5...	48.38	48.88					
Buffalo R3...	52.00	52.50	53.00				
Buffalo H1...	52.00	52.50	53.00				
Chicago H4...	52.00	52.50	53.00				
Cleveland A5...	52.00	52.50	53.00				
Cleveland R3...	52.00	52.50	53.00				
Duquesne, Tex. L3...	48.00	48.50	49.00				
Duluth H4...	52.00	52.50	53.00				
Erie H4...	52.00	52.50	53.00				
Everett, Mass. M6...		59.75	60.25				
Fontana K1...	58.00	58.50					
Geneva, Utah U1 Y1...	52.00	52.50	53.00				
Granite City, Ill. K3...	53.90	54.40	54.90				
Hubbard, Ohio Y1...	52.00	52.50	53.00				
Ironton, Utah C7...	52.00	52.50					
Jackson, Ohio J1 G1...							
Lyle, Tenn. T3...							66.00
Monessen P6...	54.00						
Neville Island P4...	52.00	52.50	53.00				
Pittsburgh U1...	52.00						
Sharpsville S3...	52.00	52.50	53.00				
Steelton B3...	54.00	54.50	55.00		60.00		
Swedeland A2...	56.00	56.50	57.00				
Toledo H4...	52.00	52.50	53.00				
Troy, N. Y. R5...	54.00	54.50	55.00		60.00		
Youngstown Y1...	52.00	52.50	53.00				
N. Tonawanda, N. Y. T1...		52.50	53.00				

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add \$1.50 per net ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. \$1 per ton for 0.75 pct or more phosphorus, manganese as above Bessemer ferro-silicon prices are \$1 over comparable silvery iron.

BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.a.b. Mill	Size	Seamless		Elec. Weld	
		OD. In.	B.W. Ga.	H.R.	C.D.
Babcock & Wilcox...	2 1/2	13	22.67	26.66	21.99
	3	12	30.48	35.84	29.57
	3 1/2	12	33.90	39.90	32.89
	4	11	42.37	49.89	41.10
		10	52.60	61.68	51.63
National Tube...	2 1/2	13	21.62	26.48	
	3	12	29.65	36.32	
	3 1/2	12	34.00	41.64	
	4	11	40.34	49.41	
		10	51.21	62.72	
Pittsburgh Steel...	2 1/2	13	27.00		
	3	12	36.40	37.15	
	3 1/2	12	34.95	42.50	
	4	11	41.48	50.54	
		10	52.65	64.10	

CAST IRON WATER PIPE

Per Net Ton
6 to 24-in., del'd Chicago \$105.30 to \$108.30
6 to 24-in., del'd N.Y. 108.50 to 109.50
6 to 24-in., Birmingham 91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipment less \$123.00 to \$130.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe in \$5 a ton above 6-in.

C-R SPRING STEEL

Cents Per Lb. F.a.b. Mill	CARBON CONTENT				
	0.25-0.40	0.41-0.60	0.61-0.80	0.81-1.00	1.01-1.25
Bridgeport, Conn. S7	5.35	6.80	7.40	9.35	11.45
Carnegie, Pa. S9...		6.80	7.40	9.35	11.45
Cleveland A5...	4.65	6.45	7.40	9.35	11.45
Detroit D1...	5.60	6.65	7.25		
New Castle, Pa. B4...	5.35	6.80	7.40	9.35	
New Haven, Conn. D1...	5.85	6.75	7.35		
Sharon, Pa. S7...	5.35	6.80	7.40	9.35	11.45
Weirton, W. Va. W3...	5.35	6.80	7.40	9.35	11.45
Worcester, Mass. A5...	4.95	6.75	7.70	9.65	11.95
Youngstown C5...		6.80	7.40	9.35	11.45

MERCHANT WIRE PRODUCTS

F.a.b. Mill	Standard & Coated Nails		Woven Wire Fence 9-15 1/2 ga.		Fence Posts		Single Loop Bala Ties		Twisted Barbless Wire		Gal. Barbed Wire		Merch. Wire		Wire Mesh	
	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.	Base Col.
Alabama City R3	118	126			123			136	5.70	5.95						
Aliquippa, Pa. J3	118	132					136	140	5.70	6.15						
Atlanta A8	121	133					126	126	5.95	6.40						
Bartonsville K2	118	130					123	143	5.70	6.15						
Buffalo W6									4.65							
Cleveland A6	125															
Cleveland A5									145	5.95	6.40					
Crawfordsv. M4		132							140	5.70	6.15					
Donora, Pa. A5	118	138					123	140	5.70	6.15						
Duluth A5	118	130					123	140	5.70	6.15						
Fairfield, Ala. T2		118	138				123		140	5.70	6.15					
Houston S2		126	138					140	5.70	6.15						
Johnston, Pa. B3	118	130							140	5.70	6.15					
Joliet, Ill. A5	118	130					123		140	5.70	6.15					
Kokomo, Ind. C9	120	132					125	138	142	5.80	6.25					
Los Angeles B2									6.65							
Kansas City S2	130						135		152	6.30	6.75					
Minnesota C6	123	138	130				128	146	146	5.95	6.40					
Monroeville P6	124	135							145	5.95	6.40					
Moline, Ill. R3					136											
Pittsburg Cal. C7	137						147	156	160	6.45	6.90					
Piquetsmouth P7	124	137						147	147	6.10	6.55					
Rankin, Pa. A5	118	130						140	140	5.70	6.15					
So. Chicago R3	118	126	140				123		136	5.70	6.15					
S. San Fran. C6							147		160	6.65	7.10					
Sparrows Pt. B3	120						125	142	142	5.80	6.25					
Sterling, Ill. N4	118	130					123	140	140	5.70	6.15					
Struthers, O.Y1										5.70	6.15					
Torrance, Cal.C7	138									6.65						
Worcester A5	124									6.00						
Williamsport, Pa. S10					150											

Miscellaneous Prices

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rail	Light Rail	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer U1...	3.60	4.00	4.70	6.15	...	...	...	...
Chicago R3...	...	...	...	6.15	...	9.35	...	...
Cleveland R3...	...	...	...	6.15	...	...	...	...
Enslay T2...	3.60	4.00	...	...	...	...	...	...
Fairfield T2...	4.00	4.70	6.15	5.60	...	4.50	9.80	...
Gary U1...	3.60	4.00	...	...	...	...	4.50	...
Ind. Harbor J3...	3.60	...	4.70	6.15	5.60	...	4.50	...
Johnstown B3...	...	4.00	...	...	5.60	...	...	...
Joint U1...	...	4.00	4.70	...	...	...	...	...
Kansas City S2...	...	...	...	6.40	...	...	9.85	...
Lackawanna B3...	3.60	4.00	4.70	...	...	4.50	9.85	...
Lahona B3...	...	...	...	6.15	9.35	...	9.85	...
Minnequa C6...	3.60	4.50	4.70	6.15	...	4.50	9.85	...
Pittsburgh R3...	...	...	...	...	9.35	...	...	...
Pittsburgh O1...	...	...	...	...	9.35	...	9.85	...
Pittsburgh P5...	...	...	...	...	...	...	9.85	...
Pittsburgh J3...	...	...	...	6.15	...	...	...	...
Put'g. Cal. C7...	...	...	...	...	...	...	4.65	...
Seattle B2...	...	...	...	6.65	...	...	4.65	...
Seashore B3...	3.60	4.70	...	...	...	4.50	...	...
Struthers Y1...	...	...	...	6.15	...	...	4.65	...
Turlock C7...	...	...	...	6.15	...	...	...	...
Youngstown R3...	...	...	...	6.15	...	...	...	...

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	\$1.505
18	4	1	—	5	\$2.13
18	4	2	—	—	\$1.65
1.5	4	1.5	8	—	\$1.06
6	4	2	6	—	\$6.56
High-carbon chromium					\$3.56
Oil hardened manganese					35¢
Special carbon					\$2.56
Extra carbon					27¢
Regular carbon					23¢
Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.					

CLAD STEEL

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.	...	...
Coatesville, Pa. L4	*29.5	...
Washington, Pa. J2	*29.5	...
Claymont, Del. C6	*28.00	...
Conshohocken, Pa. A2	...	*27.50
New Castle, Ind. J2	*29.77	*26.24
Nickel-carbon	...	...
10 pct Coatesville, Pa. L4	32.5	...
Inconel-carbon	...	...
10 pct Coatesville, Pa. L4	40.5	...
Metal-carbon	...	...
10 pct Coatesville, Pa. L4	33.5	...
No. 302 Stainless-copper stainless, Carnegie, Pa. A4	...	77.00
Aluminized steel sheets, hot dip, Butler, Pa. A7	...	7.75
* Includes annealing and pickling, or sandblasting.		

ELECTRODES

Cents per lb, f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
GRAPHITE		
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2 1/2	24, 30	23.15
2	24, 30	25.36
CARBON		
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

FLUORSPAR

Washed gravel, f.o.b. Rosiclare, Ill.	...
Price, net ton; Effective CaF ₂ content:	...
70% or more	\$43.00
60% or less	40.00

**FINGERS
must be saved—
KEEP THEM OUT
OF PRESSES with**

LITTELL

Pres-Vac

Operated by
Compressed Air

SAFETY FEEDERS

- Blanks are fed from a distance of 14 inches
- Eliminates need of putting fingers under press ram
- **BOOST PRODUCTION 20% TO 100%**
— Reported by users
- **ELIMINATE DIE BREAKAGE**
— Assures Feeding Blanks One at a Time
- **CUT INSURANCE COSTS**
— Fewer Accidents Mean Lower Premiums.

Littell Pres-Vac Safety Feeders are made in Single and Multiple types in a variety of cup sizes and styles.

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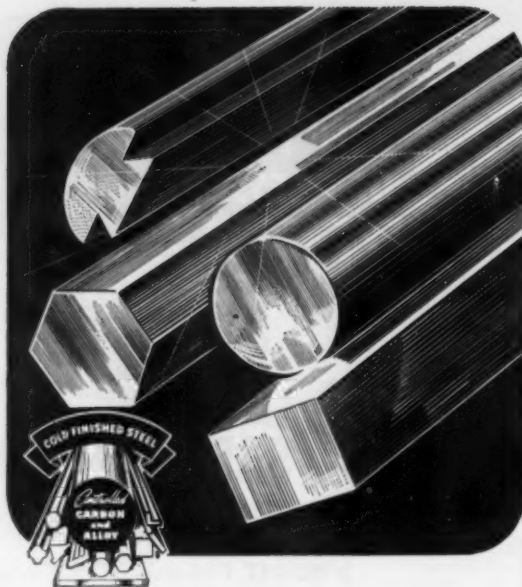
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Single cyl.
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2-cylinder
7 to 13 H.P.

V-type 4-cyl.
15 to 30 H.P.

WISCONSIN Air-Cooled ENGINES

Fit the Job and the Machine

Because Wisconsin Air-Cooled Engines are supplied in a complete power range, from 3 to 30 H.P., in 4-cycle single cylinder, 2- and 4-cylinder types, there is an ideal size to fit all types of machines and power applications within this range, without wasted power and with maximum power service benefits. Heavy-duty construction, combined with extremely compact design and light weight are added advantages—and dependable AIR-COOLING permits trouble-free service under all climatic conditions.

Specify Wisconsin Heavy-Duty Air-Cooled Engines for the utmost in power satisfaction. Write for descriptive data.



WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

Miscellaneous Prices—

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

	Less	Reg.	Less	Reg.
	Keg.	K.	Keg.	K.
1/2 in. & smaller	15	28 1/2	15	28 1/2
9/16 in. & 5/8 in.	12	25	6 1/2	21
3/4 in. to 1 1/2 in.				
Inclusive	9	23	1	16 1/2
1 1/2 in. & larger	7 1/2	22	1	16 1/2

Nuts, Hot Pressed—Hexagon

1/2 in. & smaller	26	37	22	34
9/16 in. & 5/8 in.	16 1/2	29 1/2	6 1/2	21
3/4 in. to 1 1/2 in.				
Inclusive	12	25	2	17 1/2
1 1/2 in. & larger	8 1/2	23	2	17 1/2

Nuts, Cold Punched—Hexagon

1/2 in. & smaller	26	37	22	34
9/16 in. & 5/8 in.	16 1/2	29 1/2	6 1/2	21
3/4 in. to 1 1/2 in.				
Inclusive	19 1/2	31 1/2	12	25
1 1/2 in. & larger	12	25	6 1/2	21

Nuts, Semi-Finished—Hexagon

	Reg.	Hvy.
1/2 in. & smaller	35	45
9/16 in. & 5/8 in.	29 1/2	40 1/2
3/4 in. to 1 1/2 in.		
Inclusive	24	36
1 1/2 in. & larger	13	26
	Light	
7/16 in. & smaller	35	45
1/2 in. thus 5/8 in.	28 1/2	39 1/2
3/4 in. to 1 1/2 in.		
Inclusive	26	37

Stove Bolts

Pct Off List

Packaged, steel, plain finished. 48—10
Packaged, plate finish. 31—10
Bulk, plain finish. 62*
*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.
**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

Base per 100 lb

1/2 in. & larger \$7.35

Cap and Set Screws

(In bulk)

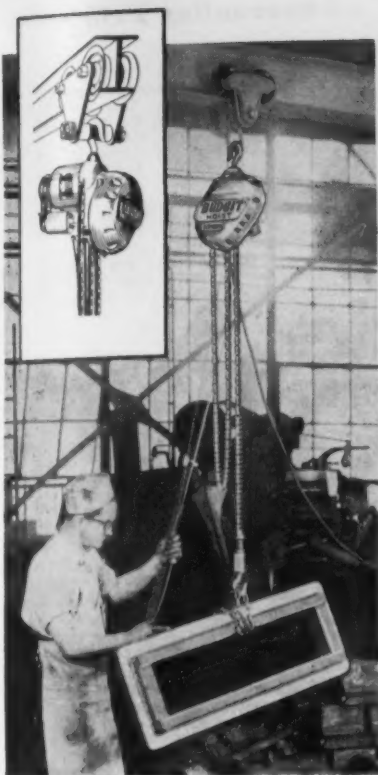
Pct Off List

Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 1/2 in. x 6 in., SAE 1020, bright 54
1/4 in. thru 1 in. up to & including 6 in. 48
1/4 in. thru 1/2 in. x 6 in. & shorter high C double heat treat 46
3/8 in. thru 1 in. up to & including 6 in. 35
Milled studs 26
Flat head cap screws, listed sizes 34
Fillister head cap, listed sizes 34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter 33

Machine and Carriage Bolts

Pct Off List

	Less	C.
1/2 in. & smaller x 6 in. & shorter	15	28 1/2
9/16 in. & 5/8 in. x 6 in. & shorter	18 1/2	30 1/2
3/4 in. & larger x 6 in. & shorter	17 1/2	29 1/2
All diam. longer than 6 in.	14	27 1/2
Lag, all diam. x 6 in. & shorter	28	35
Lag, all diam. longer than 6 in.	21	31
Plow bolts	34	41



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SAVES FAST

Greater production results when load handling keeps pace with the capacity of machines to produce. So — boost your defense and civilian output—lower your costs—with the 'Budgit' Electric Hoist. The smallest 'Budgit' lifts 250 lbs. a foot in less than two seconds. No more strained ligaments or other injuries due to manual lifting. Hoisting is safe, easy and fast because electricity does all the heavy work.

The 'Budgit' is miserly in using electricity. It's a complete load lifting unit in itself — no accessories to buy, no installation costs. Hang up, plug in, and it's ready for work. Capacities: 250 to 4,000 lbs. A.C. and D.C. models. Priced from \$119. Write for Bulletin No. 390 for more details.



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'Budgit'

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Builders of "Shaw-Box" Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, and 'American' Industrial Instruments.

REFRACTORIES

Fire Clay Brick

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5)	\$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick

Standard chemically bonded balt., Chester	Per Net Ton \$82.00
---	---------------------

Magnesite Brick

Standard, Baltimore	\$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite

Domestic, f.o.b. Baltimore in bulk fines removed	St. %-in. grains \$62.70
Domestic, f.o.b. Chewalah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢...\$13.75

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower lake ports. 1952 prices not yet established. 1951 prices were:

Old range, bessemer	\$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

METAL POWDERS

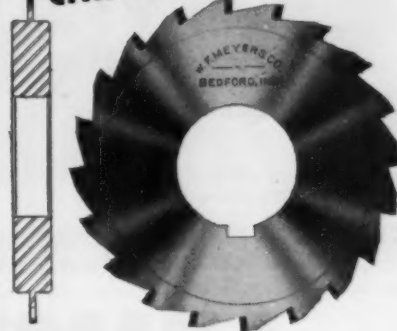
Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags...	7.4¢ to 9.0¢
Canadian sponge iron, del'd, In East	10.00¢
Domestic sponge iron, 98+ % Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+ % Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe	63.0¢ to 80.0¢
Carbonyl iron, size 6 to 10 micron, 98%, 99.8+ % Fe	83.0¢ to \$1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 32.25¢
Copper, electrolytic, 10.75¢ plus metal value	
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quantity, del'd	\$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	\$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	\$3.00¢
Stainless steel, 316	\$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	\$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢

PRECISION CIRCULAR CUTTERS



MEYCO CARBIDE TIPPED

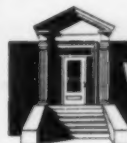


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NEW YORK SAN FRANCISCO

Ferroalloy Prices

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads delivered. (65-72% Cr, 2% max. Si.)
0.06% C ... 30.50 0.20% C ... 29.50
0.10% C ... 30.00 0.50% C ... 29.35
0.15% C ... 29.75 1.00% C ... 29.00
2.00% C ... 28.75
65-69% Cr, 4-9% C ... 22.00
62-66% Cr, 4-6% C, 6-9% Si ... 22.00

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
Carloads ... 21.60
Ton lots ... 23.75
Less ton lots ... 25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.
Carloads ... 27.75
Ton lots ... 30.85
Less ton lots ... 31.55

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.
0.10% max. C ... \$1.14
0.50% max. C ... 1.10
9 to 11% C ... 1.00

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)
Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.
Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.
30-33% Ca, 60-65% Si, 3.00% max. Fe.
Carloads ... 19.00
Ton lots ... 22.10
Less ton lots ... 23.60

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy lump, delivered.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads ... 20.00
Ton lots ... 22.30
Less ton lots ... 23.30

CMSZ

Contract price, cents per lb of alloy, delivered.
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
Alloy 5: 50.56% Cr, 4-6% Mn, 13.64-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.
Ton lots ... 20.75
Less ton lots ... 22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, 1/2 in. x 12 mesh.
Ton lots ... 17.50
Less ton lots ... 19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.
Ton lots ... 16.50
Less ton lots ... 17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. SI 48 to 52%, TI 9 to 11%, Ca 5 to 7%.
Carload packed ... 18.00
Ton lots to carload packed ... 19.00
Less ton lots ... 20.50

Ferromanganese

78-82% Mn, maximum contract price, gross ton, lump size.
F.o.b. Niagara Falls, Alloy, W. Va. ... \$1.95
Ashtabula, O. ... 1.87
F.o.b. Johnstown, Pa. ... 1.85
F.o.b. Sheridan, Pa. ... 1.88
F.o.b. Etna, Clairton, Pa. ... 1.88
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.
Carload, bulk ... 10.95
Ton lots ... 12.55

Ferroalloys

Continued

Spiegeleisen

Contract prices gross ton; lump, f.o.b.
16-19% Mn 19-21% Mn
3% max. Si 3% max. Si
Palmerton, Pa. \$74.00 \$75.00
Fg. or Chicago 74.00 75.00

Manganese Metal

Contract basis, 2 in. x down, cents per
pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max.
Si, 2.5% max. Fe.
Carload, packed 34.75
Ton lots 36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed
east of Mississippi, cents per pound.
Carloads 28
Ton lots 30
Less ton lots 32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn con-
tained, lump size, del'd Mn 85-90%.
Carloads Ton Less
0.7% max. C, 0.06%
P, 90% Mn 26.25 28.10 29.30
0.07% max. C 25.75 27.60 28.80
0.15% max. C 25.25 27.10 28.30
0.30% max. C 24.75 26.60 27.80
0.50% max. C 24.25 26.10 27.30
0.75% max. C
7.00% max. Si 21.25 23.10 24.30
Alsifer, 20% Al, 40% Si, 40% Fe,
contract basis, f.o.b. Suspension
Bridge, N. Y.
Carloads 9.90
Ton lots 11.30
Calcium molybdate, 46.3-46.6%
f.o.b. Langeloth, Pa., per pound
contained Mo. \$1.15

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract
price, carloads, lump, bulk, delivered, per
lb of contained Mn 19.15¢

Silicomanganese

Contract basis, lump size, cents per
pound of metal, delivered, 65-68% Mn,
18-20% Si, 1.5% max. C. For 2% max. C,
deduct 0.2¢.
Carload bulk 9.90
Ton lots 11.55
Briquet, contract basis carlots, bulk
delivered, per lb of briquet 11.15
Ton lots 12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk,
Iowa, or Wenatchee, Wash., \$92.50 gross
ton, freight allowed to normal trade area.
Si 15.01 to 15.50 pct, f.o.b. Niagara Falls,
N. Y., \$90.000. Add \$1.00 per ton for each
additional 0.50% Si up to and including
18%. Add \$1.00 for each 0.50% Mn over
1%.

Silicon Metal

Contract price, cents per pound con-
tained Si, lump size, delivered, for ton lots
packed.
96% Si, 2% Fe 21.70
97% Si, 1% Fe 22.10

Silicon Briquets

Contract price, cents per pound of
briquet bulk, delivered, 40% Si, 2 lb Si
briquets.
Carloads, bulk 6.95
Ton lots 8.55

Electric Ferrosilicon

Contract price, cents per pound con-
tained Si, lump, bulk, carloads, delivered.
25% Si 20.00 75% Si 14.30
50% Si 12.40 85% Si 15.55
90.95% Si 17.50

Calcium Metal

Eastern zone contract prices, cents per
pound of metal, delivered.
Cast Turnings Distilled
Ton lots \$2.05 \$2.95 \$3.75
Less ton lots.. 2.40 3.30 4.55

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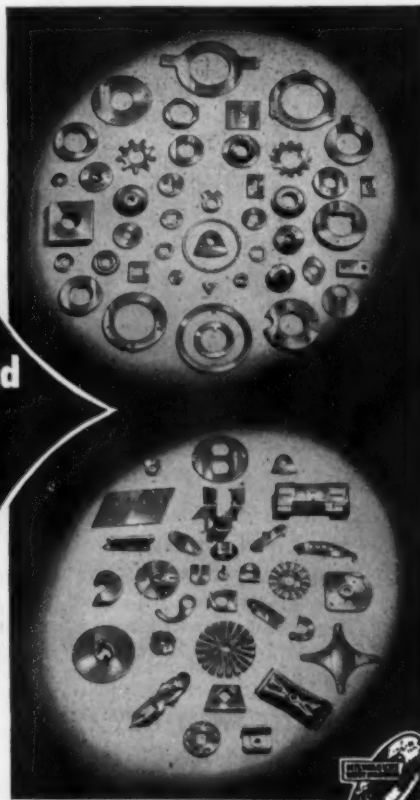
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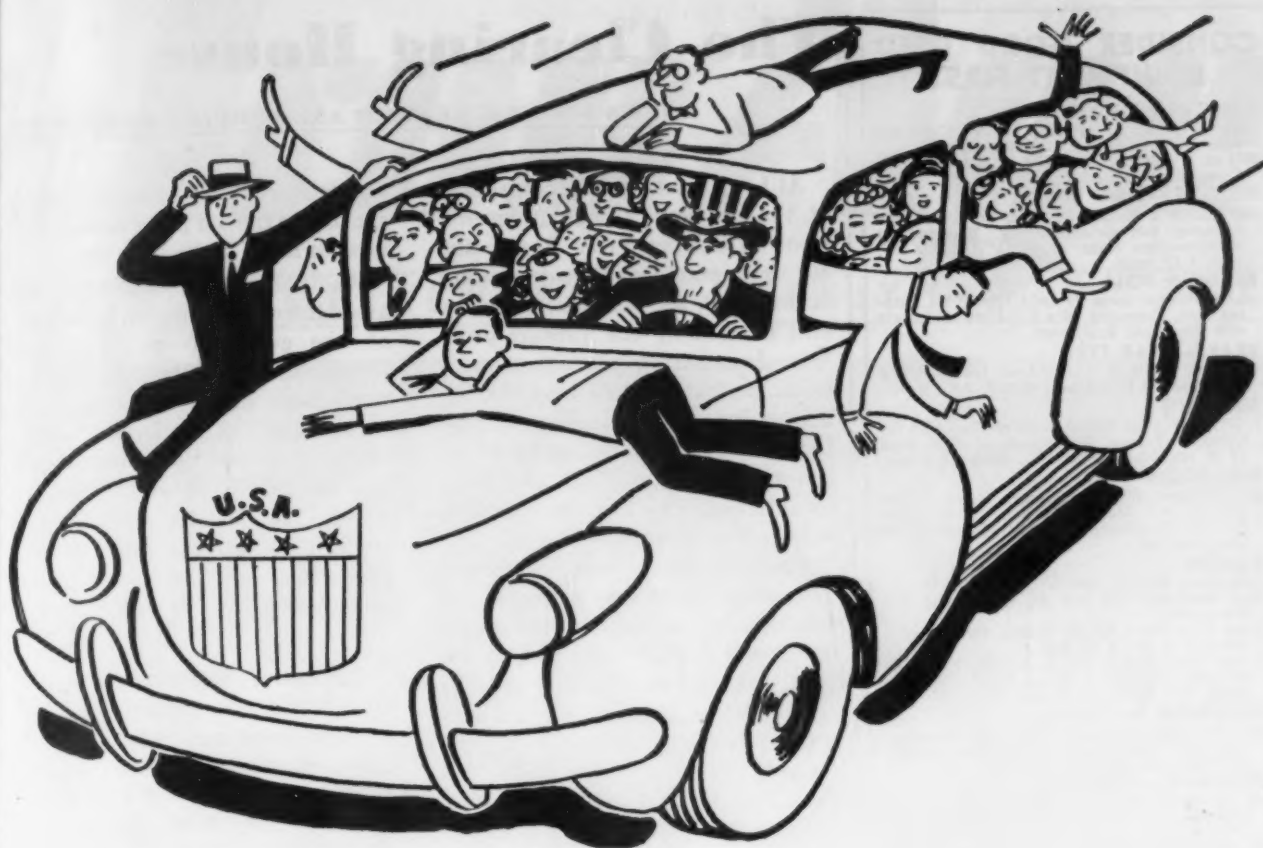
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Other Ferroalloys

Ferrocolumbium , 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.	
Ton lots	\$4.90
Less ton lots	4.90
Ferro-Tantalum-Columbium , 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	\$3.75
Ferromolybdenum , 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.41
Ferrophosphorus , electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	\$75.00
Ferrotitanium , 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.35
Ferrotitanium , 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.50
Less ton lots	1.55
Ferrotitanium , 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	\$177.00
Ferrotungsten , standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	\$5.00
Ferrovandium , 35-55% contract basis, delivered, per pound, contained V.	
Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primus)	3.20-3.25
Molybde oxide , briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	\$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.13
Simanal , 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.500
Ton lots, bulk lump	15.750
Less ton lots, lump	16.250
Vanadium Pentoxide , 86-89% V ₂ O ₅ contract basis, per pound contained V ₂ O ₅	\$1.25
Zirconium , 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.000
Zirconium , 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	7.000
Boron Agents	
Borostil , contract prices per lb of alloy, del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.	\$5.25
Bortam , f.o.b. Niagara Falls	
Ton lots, per pound	450
Less ton lots, per pound	500
Corbortam , Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.000
Ferroboron , 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.	\$1.20
F.o.b. Wash., Pa.; 100 lb up	
10 to 14% B.	.80
14 to 19% B.	1.20
19% min. B	1.50
Grainal , f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	\$1.00
No. 6	.650
No. 79	.500
Manganese-Boron , 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd	
Ton lots	\$1.40
Less ton lots	1.57
Nickel-Boron , 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	\$1.30
Less ton lots	
Silenz , contract basis, delivered.	
Ton lots	45.000

THE IRON AGE, June 5, 1952



Every Man, Woman and Child in the U.S.A. Can Go Riding at the Same Time

In the U. S. A., competition is basically responsible for better cars at lower comparative cost. We enjoy the use of three times as many cars—and annually produce four times as many cars—as the rest of the world put together. There are approximately 43 million autos—and 9 million trucks and buses—in use in the U. S. A. today. That's more than enough to take everyone riding at the same time.

By stimulating the sale of the new and the resale of the old, our competitive system achieves widespread ownership of automobiles, as with almost everything else. In most foreign countries, out of necessity people make things last as long as possible. In the U. S. A., vigorous competition prompts improvement, refinement and continuous progress. Buyers of new cars get maximum value, because each manufacturer competes actively for the new-car dollar. Lowest-income groups benefit by the lowered prices of used, yet essentially useful, prod-

ucts. Overall result: Steady jobs, good wages and the world's highest standard of living. In most of the rest of the world, luxuries come within reach of only the rich. In the United States, the irresistible drive of competition invents, mass-produces, advertises, distributes and sells—so that most of the miraculous products of modern living are within the reach of all.

Free competition—like freedom of speech, press and religion—is a dynamic part of Uncle Sam's character. Let's keep it free, so that the U. S. A. continues to be the greatest country in the world.

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THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS

Ingersoll Rand 33" x 20 1/2" x 24" Complete with 635 H.P. G.E. Syn. Motor 2300/3/60. 2873 cu. ft. Worthington 29" x 21" x 18 1/2" x 21". Complete with Elec. Equipment.

BELT GRINDING UNIT

Hill Clutch & Machine & Fdry. Co. Open Side Abrasive Belt Grinding Unit. Designed to accommodate slabs up to 3/8" thick x 30" wide x 30' long.

BENDING ROLL

No. 6 Hilles & Jones Pyramid Type Plate Bending Roll, Capacity 16' x 3/4" Plate Complete with Electrical Equipment.

BRAKE—LEAF TYPE

16' x 3/4" Drels & Krump Leaf Type Bending Brake, Motor Driven with 40 H.P. A.C. Motor.

BUILDING

72'6" x 140' Steel Building—NEW—Designed for Corrugated Steel Siding and to carry load of 30 ton overhead electric traveling crane.

BULLDOZER

#7 William White Bulldozer, Motor Driven with 50 H.P. Motor. 440 v. 3 ph. 60 cycle. Face of Crosshead 20" x 90". Movement of Crosshead 24".

CRANES

Two—5 ton P&H Cranes 55' Span 220/3/60 AC. Each equipped with two 2 1/2 ton trolleys and five motors.

5 ton Niles Crane 56' 3 3/4" Span. Three motors, 440 volt, 3 phase, 60 cycle.

5 ton Shaw Crane 70' Span, 230 Volt D.C. Magnetic Control & Cable Reel. Hydraulic Brake, Fish Belly Box Girder.

FLANGING MACHINE

3/4" McCabe Pneumatic Flanging Machine. Pneumatic Hoidowns, Circle Flanging Attachment and numerous dies.

FURNACES—MELTING

400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little Used.

15 ton Heroult Model V-12 Electric Melting Furnace Top Charge hydraulically operated. Complete with Transformer Equipment.

25 ton Moore Size "NT" Melting Furnace, with 7500 KVA Transformer 13,200 vo. 3 ph. 60 cy.

40 ton Tilting Type Open Hearth Furnace, Complete with tilting mechanism, charging platform, motors and Wellman-Seaver-Morgan charging Machine.

GEAR REDUCER

600 H.P. Farrell Birmingham Herringbone Gear Unit. R.P.M. 7.20 to 74.54 NEW.

HAMMER

10,000 lb. Chambersburg Steam Drop Hammer.

PLANERS

48" x 48" x 20' Cincinnati, Four Head

48" x 48" x 12' Niles-Bement-Pond, Four Head

60" x 60" x 12' Niles-Bement-Pond, Four Head

72" x 72" x 12' Niles-Bement-Pond, Four Head

PLATING MACHINE

Type "B" Crown Full Automatic Nickel & Chrome Plating Machine, Max. Work Size 16" wide x 36" deep x 4" thick.

PRESS—KNUCKLE JOINT

1000 ton Bliss #27 Knuckle Joint, Embossing & Coining Press, 2 1/2" Stroke, 18" Shut Height.

ROLLING MILLS

8" x 10" Schmitz Single Stand Two High With Friction Drive Rewinder.

12 1/2" x 16" Philadelphia Two High Cold Rolling Mill. Complete with Pinion Stand, 75 H.P. Motor 440/3/60. Starter and Controls, Incl. Collar.

12 1/2" x 20" Waterbury Farrel Single Stand Two High. Complete with Gear Reducer and 50 H.P. A.C. Motor.

18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.

TESTING MACHINES

300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine.

100,000 lb. Olsen Universal Hydraulic Testing Machine. Three Dial Type

TRIMMING LINE

#1049 Torrington Trimming Line, With Feed Rolls and Scrap Cutter. Capacity for steel or aluminum alloys 1/2" max. Trimmed width 22" min. 66" max. Scrap Length 3/4" min. 2 1/4" max.

WELDERS

700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide.

40 KVA Sclaky, Spof Welder, 36" Throat 440/3/60 operation.

RITTERBUSH & COMPANY, INC.

50 Church Street, New York 8, N. Y.

Phone—Cort 7-3437

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

At Long Last—With the passage of the too-long-awaited amendment to Ceiling Price Regulation 80, used machinery dealers were encouraged, not ecstatic. They are still harried by the difficult problem of operating without a price book. Indications are that the Office of Price Stabilization will issue the book with prices based on the new date of Dec. 15, 1951, established in the amendment, within 3 to 4 weeks—maybe.

The new amendment contained just about what was expected. In addition to advancing the price date from Jan. 25, 1951 to Dec. 15, 1951, the percentage table used to establish used machinery ceilings was altered slightly (see box below).

Raise the Roof—Major gain for dealers is a price increase on good used machinery manufactured after Jan. 1, 1948. Estimate is that new tool manufacturers were given price boosts averaging 14 to 20 pct between Feb., 1951 and Dec., 1951. Since the dealer percentage table covering machinery manufactured after Jan. 1, 1948 was not changed, this category benefits across the board.

The higher ceiling permitted by the amendment is expected to flush out some of the good used machine tools which have been in hiding. Users who judged their equipment

worth more than what they could get under the old price ceiling may now be more inclined to sell.

Another change effected by the amendment is reduction of number of age groups from six to five. Combined with alterations in the percentage table, this change affects only old machinery manufactured before 1928. Dealers selling reconditioned units built between 1922-28 and 1916-20 will suffer a slight loss. Sales of pre-1916 vintage, if there are any, are improved by the amendment.

Guarantee Required—The new amendment also requires sellers of reconditioned equipment to guarantee normal operation of each machine tool sold for a period of 30 days. They must also agree to accept the return of any item which does not meet the standards set forth in the guarantee.

As an optional price base date, dealers may apply appropriate percentages to manufacturers' list or quoted prices or to initial user's purchase cost, when new, at any time prior to Dec. 15, 1951.

They may also increase by 75 pct the Mar. 1, 1941 price listed in Appendix A to Maximum Price Regulation 1. A 75 pct increase is also granted on purchasers' prices for machinery bought before June 30, 1946.

The New and Old in Pricing

NEW PRICE BASE (Dec. 15, 1951)				OLD PRICE BASE (Jan. 25, 1951)			
Made After Jan. 1—	Rebuilt Guar- anteed %	Recon- ditioned %	As Is %	Made After Jan. 1—	Rebuilt Guar- anteed %	Recon- ditioned %	As Is %
1948	95	85	75	1948	95	85	75
1936	90	70	60	1936	90	75	60
1928	85	60	45	1928	85	70	50
1920	70	45	30	1922	70	50	30
				1916	60	40	20
Made Before Jan. 1—				Made Before Jan. 1—			
1920	60	35	20	1916	50	30	15